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Senate Bill (SB) 172: Governance of Nutrition in Kentucky Public Schools: Implementation Analysis Final Report

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Final Report

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Executive Summary

This report is intended to evaluate the implementation of Senate Bill (SB) 172 in Kentucky's public schools. This law requires that all schools in Kentucky implement strict nutrition standards that apply to all foods sold during the school day. This report highlights the different methods used by selected schools in implementing the requirements in SB 172. In performing my analysis, I traveled to different schools in central and southeastern Kentucky to assess how these select schools were meeting the requirements of the law. Site visits allowed me to discuss implementation strategies with school administrators and aided in my understanding of how the regulations were implemented at the street level. I also interviewed district food service directors to discover how they feel the requirements of the law should be implemented in the schools. I then went to the very top level in the state of Kentucky, and asked state administrators in the Obesity Prevention Department and the State Board of Education select questions about this policy. This was all part of an analysis of communications that demonstrates how information provided by state officials has traveled down to the schools. The analysis identified communication errors between the state and the schools. These communication errors would most likely manifest in some deviation from SB 172's requirements or a school failing to meet compliance with said regulations.

I initially selected 24 schools to contact from these two areas of Kentucky. Twelve agreed to participate. I selected these schools for contact for the following reasons: these schools were in a geographic location that made them easily accessible to me, I had time available to gather data from schools and administrators, and I examined a heterogeneous mixture of multiple school districts, rather than a single school system. These criteria were intended to increase the different methods of implementation studied for the purposes of this report. I intended to maximize the schools and school districts in my study given the short time frame allowed to create this analysis. Certain factors kept me from obtaining all 24 schools for my report: administrator refusal, scheduling conflicts, state academic testing conflicting with the allotted window of time for data collection, and the short time available to collect data. These factors all influenced the number of schools I was able to visit for my report. The state testing period (called the CATS test)

is held in Kentucky public schools every spring of the year, the exact time that I was performing my data collection in the schools. This was one of the most used excuses for administrators being unable to meet with me. The school administrators that refused for this reason told me they had many district meetings and meetings with other school administrators to organize for these tests. Although this may not be true of all administrators' refusal to participate or not respond to my numerous attempts to contact them, I do believe that it may explain a majority of the non-participation. However, I feel that this has had no affect on the results of my study.

Through my study, I found that, for the most part, every school is using a different method to comply with the regulations in SB 172. There are also no accountability measures in place to ensure that the schools are complying with the requirements of the law. The requirements in SB 172 have not been clearly communicated to school administrators and food service directors. There is a level of ambiguity in their understanding of what regulations apply to certain schools. This problem stems from the process of the bill's creation, where draft versions were made available to school administrators, but the final requirements were not clearly articulated from state personnel to the schools. The financial burden of this law falls squarely on the shoulders of the schools; most schools studied lost significant discretionary funds from the changes required to their vending sales and contracts. This loss of funding affected operations in some schools. The state however, provides ideas for alternative fund raising so that schools can potentially offset any losses suffered in the schools. Lastly, SB 172 contains an exemption for foods that meet the requirements of the National School Lunch/Breakfast Program to be sold in school meals and a la carte sales. Comparatively speaking, the requirements of the National School Lunch/Breakfast Program are less stringent than those of SB 172. This exemption potentially allows foods that would be banned from sale in schools under SB 172 to be offered via the a la carte offerings, defeating the purpose of the law.

This report makes recommendations to further improve the implementation of SB 172. The state should make an implementation model available to the school food service directors and school administrators that demonstrates an easy way to meet the law's requirements. Successful schools and their methods of implementation should be benchmarked by the state and information about them made available to all schools in Kentucky. The state should create a governing board to assess schools' compliance with the regulations in the law. It should also communicate or create financial penalties and/or incentives to entice schools to comply with these regulations. The state also needs to clearly communicate the requirements of this law with schools through this governing board. This will remove any implementation inconsistencies that still exist in Kentucky's schools. Lastly, the requirements established in SB 172 should be reworked so that a la carte items are no longer exempt from the regulations of the law provided they meet the requirements in the National School Lunch/Breakfast Program; the nutrition environment should be consistently enforced in all Kentucky public schools.

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The Problem

In 2004, the Kentucky Department for Public Health (KDPH) identified the epidemics of overweight and obesity as causing Kentucky citizens to have fewer healthy days and experience early, unnecessary death[1]. This epidemic costs Kentuckians a great deal of money to pay for obesity related illnesses and afflictions. Subsequently, KDPH issued a 2004 report in conjunction with the University of Kentucky Prevention Research Center that demonstrates how obesity is affecting Kentucky citizens, and outlines some of the best known methods to contain and prevent obesity. This report was instrumental in the formulation of the state action plan to increase Kentucky Nutrition and Physical Activity in 2005. This plan includes specific guidelines, including the regulation of foods available to students in Kentucky public schools.

In February 2006, the Kentucky legislature approved Senate Bill (SB) 172 that establishes minimum nutrition standards for foods and beverages available on public school campuses during the school day[2]. SB 172 adds new Kentucky statutory requirements that establish nutrition regulations for competitive foods and beverages, as well as requiring the implementation of wellness policies for schools that house any combination of Kindergarten through the Fifth grades in Kentucky[3]. Competitive foods are defined by any food that is sold in competition with the National School Lunch/Breakfast Program[4]. The beverage standards took effect March 20th, 2006, and the food standards took effect on the first day of the 2006-2007 school year[5]. Elementary schools are required by this policy to develop and implement a wellness policy that includes daily physical activity in addition to the nutrition requirements. This bill became KRS 158.856, and section 1 requires nutrition and physical activity reports to be produced annually at the district level.

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[1] Kentucky Obesity Epidemic 2004, page 1
[2] See Appendix of this report that illustrates the requirements of SB 172 and 702 KAR 6:090 that work in conjunction with each other.
[3] To see specific requirements of SB 172, please se Summary of Requirements; Policies, Documents and Laws for SB 172 included in the appendices of this report.
[4] For further clarification on what a competitive food is, see the appendix of this report for a detailed explanation.
[5] Taken from http://www.fitky.org/page_display.asp?pid=62

In an effort to combat the trend of obesity, the US Center for Disease Control (CDC) mandated that all states implement a state nutrition and physical activity plan. In response, the Kentucky Department of Education issued a policy for a Nutrition and Physical Activity Program. This plan emphasizes school-based measures to prevent, rather than treat, obesity in both the schools and in the community. The nutrition requirements established by Senate Bill 172 are binding in all public schools in the state that participate in the National School Lunch/Breakfast Program. SB 172's nutrition requirements are in their first year of implementation in Kentucky schools. Therefore, for the purposes of this analysis, I focused on how schools were implementing this new policy, and any shortcomings in their implementation strategy.

Relevant Facts and Organizational Context

The National School Lunch/Breakfast Program established nutrition requirements and a system of accountability that is already in place in the school systems in Kentucky and the nation. These requirements govern all schools participating in the National School Lunch/Breakfast Program. The federal government has noted that states are at liberty to pass legislation, or take necessary steps, to implement the recommendations from the Center for Disease Control (CDC) to promote nutrition and physical activity.

There are a host of other laws and requirements that govern the foods, beverages, their nutrition standards and the times they can be sold during the school day. Some of these are the WIC Reauthorization Act of 2004, 702 KAR 6:090, and the Competitive Sale Rule from 1990/1991. All of these requirements, including Senate Bill (SB) 172 have created the new focus on healthy nutrition environments in schools, the most current and strict regulations coming from SB 172.

The state of Kentucky passed SB 172 with the intent to place additional restrictions on the foods found in public schools. These restrictions call not only for strict guidelines for food and beverage offerings in the public schools, but also require that schools containing any combination of grades kindergarten through fifth grade implement a wellness policy.

The WIC Reauthorization Act of 2004 works in conjunction with SB 172 by also requiring ***all*** schools participating in the National School Lunch/Breakfast Program to implement some sort of wellness policy (elementary, middle, and high schools).

The requirements contained in SB 172 strictly govern the foods and beverages offered in Kentucky's public schools. These restrictions made it difficult for cafeteria staff to provide foods that both met the strict nutrition standards of SB 172 as well as the dietary requirements (for example; calories, carbohydrates, protein, and iron) of the school breakfast and lunch program. Food service staff struggled to identify foods that would meet the requirements of SB 172 as well as meet the nutrition standards under the National School Lunch Breakfast Program[6]. For this reason, during the bill's creation, clauses were added to the bill that would allow foods that met the National School Lunch/Breakfast Program requirements to be exempt from the requirements of SB 172. This would allow schools to provide healthy meals to students, while at the same time alleviating the problems that the stricter requirements from SB 172 created for school food service staff. However, as the bill was being further amended, a clause was added into the regulations that would exempt a la carte items from SB 172's requirements provided these items met the requirements of the National School Lunch/Breakfast Program. This would allow schools to potentially sell unhealthy foods so long as the foods met one of the less stringent federal guidelines in the NSLP. One of the examples provided to me by one food service director was that of a donut. Donuts do not meet the requirements of SB 172; however they meet the NSLP requirement of enriched flour or the bread component (depending on the type of planning menu the school uses)[7].

The federal government has established three different menus food service directors are to use to remain in compliance with the National School Lunch Breakfast Program. These three are the Traditional Food Based, Enhanced Food Based, and Nutrient Standards Menu options for creating school meal menus[8]. These planning menus allow food service directors to meet the requirements of the National School Lunch/Breakfast

[6] Interview with Michelle Coker; Fayette Co. Schools Food Service Director.
[7] Interview with Michelle Coker; Fayette Co. Schools Food Service Director.
[8] Interview with Michelle Coker; Fayette Co. Schools Food Service Director.

Program with three different avenues. The Traditional menu focuses more on providing foods to children within the basic calorie needs of each age group. The Nutrient Standards menu focuses more on providing a greater amount of nutrients to students (iron, Vitamin A, Vitamin C, etc.) compared to the Traditional menu. The Enhanced Food menu offers the most nutrient rich foods for students. All three have different breakdowns for requirements per age group. It is the discretion of the Food Service Director as to which type of menu to use in the school system; no one menu is required. The Traditional menu has the greatest breakdown, including groups for preschool age children, grades K-3, and grades 4-12. The Enhanced menu has more of a traditional grade breakdown, with a group for preschool children, grades K-6, and another grouping for grades 7-12. The requirements for these grades are all averaged over the week. This would mean that all nutrition information kept on file is summed and averaged over the course of the school week (typically 5 days). As one food service director illustrated, this is how schools can potentially serve donuts in the a la carte offerings. They can have two days of high caloric intake, and then average it out with three days of lower caloric intake[9]. By capitalizing on the averaging effect, these schools will meet the nutrition standards for the week, rather than meeting the requirements every day. One particular food service director noted this pitfall, and recommended the only way to prevent this from happening is to change from weekly averages to daily statistics[10].

Food Service Directors (FSD) in the school districts I visited create the menus on some preset time frame (monthly, biweekly, triweekly) for distribution to the school's cafeteria manager. The Food Service Directors uses the National School Lunch/Breakfast requirements and menu planning options (listed above) to create the schools' menus. Food Service Directors also identify food vendors and products that Cafeteria Managers may purchase in order to prepare school meals. They compile lists of foods that meet the requirements of the NSLP and SB 172 for purchase by the schools. These lists are then sent to school cafeteria managers, and they order supplies and schedule delivery dates. There is little leeway for cafeteria managers and staff to deviate from these menus and

[9] From interview with Doris Cooper; Bell County Food Service Director.
[10] From interview with Doris Cooper; Bell County Food Service Director.

pre-selected foods that Food Service Directors create and identify. Food Service Directors supervise the Cafeteria Managers, work with the schools to ensure compliance with regulations, and at times talk with students to assess their opinions of the foods, and other steps the food service department can take to make the meals more enjoyable.

According to one particular interview I obtained, FSDs are also required by SB 172 to assess the physical activity environments in the schools[11]. This puts additional burden on the FSDs in the school systems. SB 172 requires that nutrition and physical activity assessments be performed in the districts, but not on the individual school level. These reports are compiled from data collected from each individual school that are submitted by the school's principals[12]. The information is compiled for the district, and reflects the average nutritional value for the school meals, how many students participated in the National School Lunch/Breakfast Program (NSLP), participation in the free/reduced meal program in the NSLP, and the physical fitness activity in these respective school districts[13]. These report cards are submitted to the Kentucky Department of Education (KDE) and are distributed to parents via the students. There is a move to make these report cards available online for all school districts in Kentucky.

Cafeteria managers (CM) are in charge of supervising the day-to-day operations in the schools. They are in charge of staffing, ensuring proper preparation of foods, temperature monitoring, facility cleanliness, and maintaining production records. These production records contain vital information that is used by the schools to apply for federal reimbursement from the NSLP. These records contain information like the amount of students served, serving sizes, respective nutrition information, ingredients, recipe numbers (from preset lists of recipes), and food temperature readings. These records are used for auditing food services to determine if schools and districts are compliant with governing regulations in the NSLP. Schools are audited by the federal government every five years with a Coordinated Review Effort (CRE), which is designed

[11] Interview with Michelle Coker; Fayette Co. Schools Food Service Director.
[12] From interview with Doris Cooper; Bell County Food Service Director.
[13] Assessed from the requirements in creating a Nutrition Report Card, as well as from actual copies of school Nutrition Report Cards.

to be an all-encompassing review of the food services in the district. If schools are found to have violated any requirements in the NSLP, they are required to refund any reimbursement the federal government provided for the day(s) in violation. This provides financial penalties to entice compliance with the regulations of the NSLP.

However, there are no real clear accountability measures in place to entice compliance with the requirements of SB 172. As this policy is a state measure to control the nutrition environment, and the NSLP is a federal program, no financial penalties are yet associated with the law. KDE official Paul McElwain conceded this point that there was no level of accountability to encourage schools to comply with SB 172[14]. Every food service director, when asked about any accountability measures, mentioned the reimbursement incentive to comply with the NSLP requirements. However, through these interviews, it became evident that there was a lack of communication as to what a violation of SB 172's requirements would mean for the schools. One said that no incentives or disincentives existed outside of the federal program[15]; another said that the requirements of SB 172 were also enforced through return of federal meal reimbursement[16], and another said that return of federal meal reimbursement would be a next step to ensure compliance in future years[17].

Meal reimbursements for the schools come indirectly from the federal government[18]. Money for the NSLP comes from the federal government to the state government. This money is housed there, and schools submit food service records online to begin the process for reimbursement. These records act as requests for reimbursement, and when submitted online, begin the reimbursement process. The actual reimbursement comes from the state from funds provided by the federal government. The state receives and holds this money while at the same time auditing the schools' compliance with the NSLP requirements. Since SB 172 contains a clause that exempts foods offered in the National School Lunch/Breakfast Program from the requirements of the law. This creates a

[14] Interview with Paul McElwain, Kentucky Department of Education.
[15] Interview with Michelle Coker; Fayette Co. Schools Food Service Director.
[16] From interview with Debbie Mayes; Middlesboro Independent Schools Food Service Director.
[17] From interview with Doris Cooper; Bell County Food Service Director.
[18] From interview with Doris Cooper; Bell County Food Service Director.

compliance mechanism for schools so that if they meet the requirements of the NSLP, then in effect they are also in compliance with the law's requirements. The states play a vital role in auditing the schools' compliance of these requirements as they are in a better position to audit every public school in their respective states compared to the federal government's Department of Education.

Kentucky and the NSLP require schools use an "offer versus serve" format in providing meals. Offer versus serve requires that schools offer a minimum of five different menu items, and that students are required to be served or serve themselves at least 3 of those items for the meal to count as a reimbursable meal. If a meal does not have 3 items, it does not count as a "full meal" and is not eligible for federal reimbursement. The schools, however, normally do not take measures to ensure that these 3 items are actually consumed by the students.

Literature Review

In reviewing literature related to implementation analyses, I found three articles that lend their knowledge to the base of this report. These three reports come from O'Toole[19], Jr., Mazmanian and Sabatier[20], and Edwards, III[21]. They all address problems with and ideas for successful policy and program implementation.

Factors for successful implementation

Mazmanian and Sabatier identify seven factors that will increase the success of legislation that seeks to change the behavior of target groups. (1) The objectives must be precise and clearly ranked, (2) the legislation incorporates a valid causal theory, (3) the legislation provides adequate funds to the implementing agencies, (4) the number of veto points in the implementation process is minimized and sanctions/inducements are provided to overcome resistance, (5) the decision-rules or the implementing agencies

[19] Theory-Practice in Policy Implementation Research, Public Administration, Vol. 82 No. 2, 2004 (pgs. 309-329). Laurence J. O'Toole, Jr.
[20] Effective Policy Implementation, Mazmanian, Daniel A., Sabatier, Paul A. (pgs. 6-24).
[21] Public Policy Implementation. Edited by George C. Edwards, III. From Public Policy Studies: A Multi-Volume Treatise, Volume 3. (pgs. 60-77).

support the legislation and its successful implementation, (6) the implementing agency ranks the policy or program implementation as a high priority, and (7) the provisions for outsider participation are similarly biased through liberalized rules of standing and by centralized oversight in the hands of statutory supporters. Mazmanian and Sabatier recognize that often statutes do not structure the implementation process very coherently.

Mazmanian and Sabatier also assert that the absence of a causal theory and/or the requisite technology may present problems in the successful implementation of statutory objectives. Mazmanian and Sabatier stress that having a small and definable target group for behavior modification increases the chances of successful policy implementation. The basic premise of policy implementation is that if behavior modification of a target group can be caused, then essentially the problem can be ameliorated. The amount of behavior change required to achieve success will depend largely on the size of the target group; it is easier to get fewer people to change their behavior than larger groups. Problems are most tractable in policy implementation if (1) there is a valid theory connecting behavioral change to problem amelioration, (2) there is minimal variation in the behavioral practices that cause the problem (outside or intervening variables), (3) the target group constitutes an easily identifiable group, and (4) the amount of behavioral change is modest. They argue that one of the goals of policy analysis is to develop better tools and reliance on economic incentives to institute behavioral change.

A statute that requires policy implementation should establish a clear set of standards and objectives, incorporate a sound program theory to reach these objectives, and structure the program so that successful behavior modification can be achieved. This will enhance the chances of successful policy implementation. Causal theories are very important, as they help specify the way that objectives can be obtained. One of the major benefits of implementation analysis, according to the authors, is its emphasis on the overall theory for obtaining the desired changes. An adequate causal theory requires: (1) the linkages between intervention and attainment of program objectives are understood, and (2) the administrators responsible for implementing the program have jurisdiction over a sufficient number of the critical linkages to actually obtain objectives. Mazmanian and

Sabatier identify that inadequate casual theories lie behind many of the cases of implementation failure.

Hierarchical integration is also important for any statute being implemented, in that the statute needs to integrate implementing agencies. Division amongst these agencies can only inhibit successful implementation. The degree of hierarchical implementation is determined by (1) the number of "veto/clearance" points involved in the attainment of statutory objectives and (2) the extent to which supporters of statutory objectives are provided with incentive or sanctions to comply. "Veto/clearance" refers to points where administrators have the opportunity or capacity to impede the achievement of statutory objectives. If these sanctions or incentives are great enough, the number of veto points can delay, but probably never fully impede, compliance by target groups.

Mazmanian and Sabatier specify that in order to ensure achievement of statutory objectives and modify the behavior of target groups, it is necessary to obtain buy-in from policy administrators. These administrators need to be "strongly committed to the achievement of [the statutory] objectives" (page 13). Administrators cannot merely be neutral, but must be persistent to enforce the requirements of the statute. They identify mechanisms that are available for implementing officials to achieve commitment. First, the responsibility of implementation should be assigned to agencies whose orientation is most consistent with the statute requirements, and will most likely make this program their agency's highest priority. Mazmanian and Sabatier recommend assigning responsibility for implementation to a prestigious existing agency that has goals in line with the statute and is looking for new programs to implement as an alternative to this first mechanism should it be unavailable. Second, the statute can specify that administrators be selected from social sectors that generally support the legislation's objectives. They would serve as the "opinion leaders" to promote the necessary changes to administer and implement the new policy or program. They do note that the selection of implementing officials is constrained in practice and in many situations policy.

Key factors in implementation failure

Edwards, III, addresses this concern in his work on Public Policy Implementation, Volume III (pages 60-97). Edwards, in his writing, discusses the work of Van Meter and Van Horn. These authors identify three basic sources of non-compliance in policy implementation that hold true today and apply to my area of study (page 63). Non-compliance arises when implementers (1) may not know what it is that they are expected to do, (2) may be unable to do what they think they are supposed to do, and (3) may not want to do what they believe they have been told to do. These sources of non-compliance however only deal with the superior-subordinate (superior-implementer) relationship in policy implementation. This relationship is one between the policy or program implementing agent, and that person's superior (who issues the requirement the policy or program is implemented). Edwards also identifies two important factors that determine if policies are implemented correctly from the implementer standpoint. These are agent disposition and agent capability. Either the agent agrees with the policy goals or policy design or the agent will not. This illustrates agent disposition and will influence how the policy is implemented, or if it is implemented at all. The other factor determines if the agent can perform the designed activities from the statute. If the agent is unable to implement the policy because of a lack of resources, this will influence the policy's implementation. Needless to say, implementer participation and efficacy is very important in determining success. This can be the case in SB 172's implementation; school administrators have a great deal of discretion in how the policy is implemented in the schools. Thus, their preferences and opinions of the programs will directly affect how the policy is implemented according to Edwards' findings.

Variable policy implementation that results from implementer discretion

O'Toole, in his writing, notes that in policy implementation, managers operate in environments where aspects of their settings interact with each other, and these complicated interactions can be difficult to model, let alone predict. Managers are looking for a repertoire of analytic models as heuristics (or instruments) for experimenting with different approaches to complex problems to achieve a desired,

intended result. These heuristics are designed to promote a manager's success in implementing a policy. O'Toole assesses Lynn's work on heuristics, and according to Lynn, heuristics are "the way to stock and condition the mind for its intuitive, creative work" (Lynn, L.E., Jr., 1996. Public Management as Art, Science, and Profession. Chatham, NJ: Chatham House. Pg. 107).

O'Toole also notes that analytical models are designed to be more of a repertoire for managers, and not a "magic bullet". The complex relationship between theory and practice in policy implementation, as well as the normative dimensions of implementation call for something more than just a "cookbook". Managers need something more analytically sound in order to successfully implement a policy. Heuristics can help, according to O'Toole, but he cautions that "no one particular perspective or developed theory will suit the needs of a single practitioner" (page 321). Thus, O'Toole would agree that it would be best for each implementing authority to tailor the policy more to their needs in order to find a practice that best suits their environment best. This experimentation would allow each authority to determine what works best for their particular situation. Any best practices work would be offered to secondary implementers as a means of providing guidance only, and not a sure-fire method for successful policy implementation. These recommendations, or heuristics, would be offered in more of a buffet style, where administrators can pick and choose as needed to experiment with their own type of policy implementation.

Mazmanian and Sabatier identify that implementation often has an "inherent dynamism" driven by two processes; (1) any program that aims to change behavior to receive constant and/or periodic infusions of political support and (2) the effect of continuous changes in socioeconomic and technological conditions on the reservoir of support for those objectives among the general public, interest groups, and sovereigns. Policy outputs of implementing agencies depend in large part on well drafted legislation that guides the objectives of the policy. Articulate legislation will guide the program or policy through these two dynamisms.

Programs can vary over time and from place to place. Mazmanian and Sabatier identify four ways in which variation of time and local settings can influence support for this program, three of which apply to my area of study. First, variation in socioeconomic conditions can affect perceptions of the importance of the program. Second, successful implementation can be rendered more difficult by variation of socioeconomic conditions when local variation is intertwined with it. This can affect the seriousness of the problem being addressed. An example of this would be when the nation has high unemployment. A local town may already have high unemployment too, but if a major employer were to leave that area, it would significantly increase the problem of unemployment for that particular area compared to the national average. The variation of socioeconomic conditions creates pressures for local administrators to exercise discretion in making the program or policy fit the situation. This discretion increases the chances of variation in the policy outputs of implementing agencies provided the implementation is still consistent with the requirements of the statutory objectives. Lastly, the support for this regulation seems to be associated with the economic viability of target groups and their relative importance in the total economy.

Problems can stem from policies that do not clearly dictate objectives or guidance for implementers. Edwards identifies that policies can vary in the explicitness with which goals are conveyed (page 64). Some policies can be very vague and allow implementers a great deal of discretion in interpreting goals of the policy/program. Still others contain such a level of detail that it is very clear what implementers should do. Any change from the policy goals or policy design can imply a change in the policy itself and its outcomes. This policy evolution characterizes policy implementation in the real world; sometimes policies are designed in a utopia, and do not function as intended when implemented. Thus, policy implementers adapt the policies to their environments to increase the chances of success, altering the policy and to some degree altering the policy outcomes. These adaptations can create different, perhaps more efficient, more effective, more innovative, or more self-serving policy designs (page 67). Edwards also discusses "mutual adaptation", where both the policy and the implementer change during the implementation process. Changes in the implementer occur when there is agreement to a

policy design (superior-subordinate/implementer agreement) that is different that originally intended. This influences how the policy is then implemented, and thus you have a simultaneous changing of the implementer and the policy.

Incentivized Implementation

Edwards discusses the incentive system by introducing the idea that the principal-agent relationship in implementing policies. He notes that because of information, reward, preference, and capability variations, agents may not perform as their principal's desire. He argues incentivized performance and program analysis can correct this principal-agent problem. As noted earlier, implementation often occurs in a system in which the policy goals and the conditions for implementation (environmental factors) are often changing. Implementation failure with regards to principal-agent relationships normally occurs if the policy goals are unstable.

Edwards argues in his writing that "every adequate model of implementation must have incentivized relationships as a key component, implicitly or explicitly" (page 69). He discusses two types of incentive failures in policy implementation that are very relevant to this body of work; (1) intra-agency failures, and (2) extra-agency failures. Intra-agency failures are categorized by a lack of clarity of the principal's goals and their communication to the agent, the poor design of rewards/penalties, and the inability of the implementer to respond as requested to the goals (page 70). Extra-agency failures can result from the existence of competitive agency relationships (turf-wars) as well as non-competitive systemic or emergent factors either in network coordination or performance problems (page 70).

An incentive program is designed to serve as the stimuli that evoke behavior (page 86). Incentivized programs include the elements of relationships between a sender of incentive information and rewards, either positive or negative, and a receiver of the incentive information that induces implementers to act in certain ways to receive the "behavior-contingent" rewards (pages 86-87). These incentives will make implementers act in ways that are consistent with the policy in order to receive these rewards. This

behavior will increase the compliance levels of implementers, and thereby increase the chances of the policy achieving its goals.

Conclusion

This literature adds to the body of knowledge in this report by addressing recommended practices in implementing public policy as well as causes of implementation failure. The work of Edwards, III, Mazmanian and Sabatier, and O'Toole can help one understand why some policy implementations fail and others are successful. Their findings have been noted, and hopefully this report will add to the body of knowledge that describes implementation analysis.

Research Design

Researchable Questions:

(1) Is Senate Bill 172 being implemented consistent with the intent of the law in Kentucky public schools?
(2) How can implementation of Senate Bill 172 be improved in Kentucky's public schools?

I have undertaken this project to assess the relative methods used by the schools to comply with this law and to determine if there are any deficiencies in the implementation of the law that can be corrected by the state. My analysis was initially intended to determine best practices that the schools use. However, through the interview process, I determined that there were problems with the implementation of the new law in both the communication process and measures of accountability. This analysis highlights these problems, as well as the different methods schools are using to implement the requirements of the policy, and suggests recommended courses of action for both the state and the schools.

Methods of Gathering Data

Site Visits:

I performed site visits to selected schools in Kentucky to assess how each school is implementing the requirements of SB 172. These site visits assessed the different methods schools were taking to implement the requirements established by SB 172. The intent of the study was to determine how different schools are implementing the same policy. These schools were selected from the Central and Southeastern part of the state, primarily due to geographic accessibility and time constraints in performing this analysis. I contacted school administrators and arranged permission to visit the schools. The nutrition environment (foods offered by the schools) was assessed, along with any changes the schools underwent to meet the requirements of the law. The primary focus of this study was on the food preparation methods, vending items, and a la carte items offered in the schools.

I determined that I required 10 to 15 site visits in order to observe enough variation in how schools are implementing the new policy. I arrived at this figure primarily due to the limited time available to assess the variation in schools' application of the new policy. This range of site visits provided a fair understanding of how different schools in Kentucky are implementing the same policy.

Interviews:

I interviewed school administrators, food service directors, and state officials to identify potential problems with the policy as well as how it is being implemented in the schools. I asked school administrators and food service directors different, but related sets of questions. This helped to gather corroborating evidence in assessing the actual methods schools are using to comply with this law. The top level of the trickle-down analysis required me to ask a related, but different set of questions to state officials in the Kentucky Department of Education (KDE). This analysis provided a top-level look at the system, a mid-level look at the system, and a grass-roots level look at the system of food delivery and how administrators are complying with the regulations. This trickle-down

analysis is designed to assess any variation in communication as the requirements are communicated from state administrators to the school level. I also identified if different strategies exist in the law's application and any reasons behind the variation in policy implementation. I identified school administrators, food service directors, and officials in the Kentucky Department of Education for interviews and arranged meeting times or phone interview times for my data collection. Three different lists of open-ended questions were compiled for interviews with administrators, along with contact information for all interviewed officials[22]. A summary of my findings from these site visits and interviews is also included in the appendices of the report.

A contact information matrix can also be found with the interview summaries and includes school name, school address, contact phone number, contact email address (if available), date of interview, time of interview, and whether the interview was done in person or by telephone. Any refusal or non-response from administrators was noted in the contact matrix, which illustrates all attempts made to contact administrators for interview. In performing these site visits and interviews, if school officials were not willing to participate I assumed that it would not bias the information in this implementation evaluation. The particular time that I performed this assessment was a very hectic time for schools in Kentucky. I performed my assessment around the time of state testing in the public schools. The conflict between my limited time frame for analysis and the state's emphasis on standardized test scores left some school administrators unable to meet with me for my research[23]. This conflict along with my limited time frame for data gathering limited my site visits to 12 schools. My analysis identified a small number of schools that were non-compliant with the new policy, and identified weaknesses and inconsistencies in the policy and its communication that require correction.

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[22] The term administrator and official is more of a generic term for the purposes of this analysis. Both school personnel and school system officials (superintendents, board members) will be contacted. However to decrease time wasted, I would want to interview only officials that have a sound level of familiarity with the program.

[23] This was the most commonly used reason for school administrators to refuse to meet with me.

Additional sources of data:

Any and all data and records made available by officials that pertain to foods available in Kentucky public schools were included in the analysis of the policy. State laws and policies were summarized to clarify what the requirements state. The data are summarized in the body of the report and included in the appendices of the final report.

Schools identified for contact for site visits:

Two particular areas were identified in the state of Kentucky for site visits. These two areas were the greater Lexington area and Southeastern Kentucky. I selected a multitude of schools for contacting to ensure a large enough sample size to assess variation in policy implementation.

The following schools were selected for participation based on purposive sampling procedures from the geographic areas.

Lexington Area:	Southeastern Kentucky:
Henry Clay High School	Lynn Camp High School
Harrison Elementary	Knox Central High School
Lafayette High School	Corbin High School
Bryan Station High School	Flat Lick Elementary
Ashland Elementary	Lone Jack Elementary
Dunbar High School	Pineville High School
Tates Creek High School	Pineville Elementary
Tates Creek Elementary	Bell Central Elementary
Maxwell Elementary	Bell County High School
Johnson Elementary	Middlesboro High School
Arlington Elementary	East End Elementary
	West End Elementary
	Yellow Creek Elementary

Of the schools initially identified for site visits and interviews, these are the schools that agreed to participate in my study:

Lexington Area	Southeastern Kentucky
Ashland Elementary Bryan Station High School Johnson Elementary Tates Creek Elementary	Bell Central Elementary Bell County High School Corbin High School Middlesboro High School Pineville Elementary Pineville Elementary West End Elementary Yellow Creek Elementary

I tried to study equal numbers of elementary and high schools to help in assessing how the two different types of schools are implementing the same policy. To further aid in assessing implementation variation of the schools participating in the study, these schools come from five different school systems (Middlesboro Independent, Bell County, Pineville Independent, Corbin Independent, and Fayette County School Systems). As different school systems can enact different district policies that will govern their school systems, this provides a better look into how different districts as well as schools are implementing the requirements of SB 172.

I attempted to visit as many schools as possible to assess variation in policy implementation. Of the 24 originally identified for the study, I could only visit 12. Certain factors kept me from obtaining all 24 schools for my report: administrator refusal, scheduling conflicts, state academic testing corresponding to the time I was gathering data, and finally lack of time. These factors all influenced the amount of schools I was able to visit for my report. Two factors seemed to correspond to each other; scheduling conflicts seemed to be present with a majority of the schools that were heavily focused on the state academic testing. These tests (called the CATS test) are held in Kentucky public schools every spring of the year, the exact time that I was performing my data collection in the schools. This often left administrators unable to meet with me, as they had many district meetings and meetings with other school administrators to organize for these tests. I cannot explain why all administrators refused to participate or return my many attempts to contact them. I do feel that their refusal to participate in my study has not biased he

results. The focus of this analysis was to identify different methods schools were using to comply with the regulations in SB 172 and any problems with the policy, not to identify non-compliance. Therefore, I feel that administrator refusal has had no affect on the results of my study.

Middle schools were not included in the analysis. The primary reason for not including these schools in the study was because of the school systems studied for this analysis, only three of the five had middle schools. Two of the five did not have middle schools, but rather had integrated grades 6 through 8 into either the middle or high schools. Therefore, these middle schools were not completely comparable. Of the schools surveyed, these methods of implementation were for the most part passed down from the school board to the schools in the system. Therefore, assessing the middle schools in these programs would have no added benefit to this study. These methods of implementation for each school system, for the most part, assess the methods used by that particular school system studied.

It is the intent of the program to change dietary behaviors of Kentucky public school students. The targeted groups for analysis react differently to the same policy. Elementary school students receive most, if not all, of their dietary needs from school provided meals. There is little freedom for elementary students to access food outside of breakfast and lunch at schools. High school students, however, possess a different level of autonomy and freedom to choose their sources of nutrition. Comparatively speaking, high school students possess more economic freedom to purchase additional food items from the a la carte venues in schools (including vending machines or snack lines) and also possess modes of transportation that allow them to venture outside of the campus area to obtain non-traditional lunches. These differences in behavior and freedom were studied and controlled by focusing on elementary and high schools for this implementation evaluation. Please note that even though high school students may possess a different level of autonomy than elementary school students, the school day structure and regulations still have an overarching impact on students' access to off-

campus foods (i.e., closed-campus lunches and governing regulations for delivery items to schools).

Data Analysis Plan

All data collected during site visit interviews were used to determine compliance with SB 172. The nutrition standards of SB 172 possess such a level of detail that determining if a school was either in total compliance, partial compliance, or not in compliance with the policy proved easy. Observations and interviews from school administrators were assessed against the policy to determine the level of compliance for the respective school. Shortcomings, as well as acceptable levels of implementation, were documented specifically for the implementation analysis. Summary figures and descriptions of each school's methods of implementing SB 172 were also documented for the purpose of this analysis and may aid in benchmarking successful programs for the state.

Administrator responses to interview questions provided information about the policy's implementation in schools as well as different school's compliance with SB 172. These interviews contain pertinent data as to the methods of accountability for the policy, financial impact in the schools, nutrition environment in the schools, specific vending times in vending machines, and a la carte sales, and assessing the roles of other important players in the implementation of the law.

Interview questions were created to guide discussions with administrators in order to determine efficacy of the new policy and determine actions the schools were taking to comply with the regulation. This qualitative analysis was used to assess school behavior and actions since observational data were not intended to completely suffice in determining a schools' compliance. A matrix will summarize these interviews in the appendices of the final report. They describe each school's compliance or non-compliance with the policy. This will make it easier for the reader to understand the methodology used to assess a school's level of compliance as well as any shortcomings found in each school.

Analysis and Findings

I. Of the schools surveyed in my analysis, each school is taking a different method to implement the requirements of Senate Bill 172.

Each school is using different methods to comply with the requirements of SB 172. Some have changed their menu items, food preparation methods, foods offered in their a la carte lines, vending items, and their nutrition environments. A nutrition environment refers to how the schools emphasize healthy eating and moving away from food for rewards. All schools implemented some of the regulations contained in SB 172, some implemented stricter policies than other schools. An entire matrix of the schools surveyed and how they are implementing the nutrition requirements of SB 172 can be found in the appendix[24]. This information was created from interview and site visit data from participating schools to determine each school's compliance with SB 172.

Of the schools surveyed, my results are briefly summarized in the following chart:

Compliant	Non-compliant	Deviation
Yellow Creek E		
West End E*		
	Middlesboro HS	Availability of non-compliant soft drinks during the school operational day.
	Bell County HS	Methods of food preparation as evidenced by interviews with school administrators.
Bell Central E*		
Pineville E		
Pineville HS		
Johnson E		
Ashland E		
Bryan Station HS		
Tates Creek E		
Corbin HS		

* Denotes schools that policed non-compliant beverage vending machines that were accessible to students during operational hours. The policing of these machines removes the schools from the non-compliant category to the compliant.

[24] See page 34-36 of this report (appendices) for the summary of school compliance with SB 172's requirements.

For further clarification on the schools' compliance level, please see pages 34-36 in the appendices of this report.

This finding directly relates to the literature on policy implementation. When implementers are granted leeway in their implementation strategy, there are greater chances for variation in how these institutions comply with the policy's requirements. This may result from "policy evolution". SB 172 may have been drafted without considering how different schools from different areas of Kentucky would implement the law. Thus, you would see schools adapting how they implement the law for their target population in order to increase the chances of successful implementation. Schools should be experimenting with implementation so that the state can benchmark successful school program for the benefit of other schools. These "best practices" can aid school administrators by giving them ideas on how to change their nutrition environment to meet the requirements of the law.

II. *There is a lack of clear methods of accountability and oversight to ensure that schools are complying with the requirements established in the law.*

Through the interview process, it became evident that schools and food service directors were unclear of any uniform methods of accountability that would keep the schools on par with the requirements of SB 172. State officials, some school administrators, and some food service directors told me that there were no methods in place to enforce the requirements of SB 172. Some school administrators and food service directors told me that there were strict financial penalties in place for SB 172. They told me these penalties are assessed in conjunction with the National School Lunch/Breakfast Program. However, all agreed that the primary method of accountability in the schools to meet the nutrition requirements were the Coordinated Review Efforts (CRE) performed by the states every five years as part of the National School Lunch/Breakfast Program. Any audits that revealed compliance problems could result in the schools losing reimbursement for any meals provided and potentially result in recommendations that the

food service staff be replaced[25]. Regardless, there is a lack of communication from the state as to what financial penalties are in place if a school were found in violation of SB 172.

This finding relates to the body of literature included in this report's literature review. When there is a lack of clear methods of accountability and oversight to ensure compliance with the regulations, this can negatively affect successful policy implementation. Schools have no incentive to comply with this law. By applying incentivized implementation (Edwards, III), schools will either (a) comply with the regulations and potentially receive financial gain or (b) face financial penalties for their non-compliance. Incentive based implementation will provide the necessary stimulus for change in the schools.

III. There is a level of ambiguity in the legislation. Administrators are uncertain which parts of the new law apply to their school and what parts do not. This is partly responsible for the different methods of implementation at the schools surveyed.

Part of this ambiguity came from the creation process of SB 172. As discovered through my interviews, initial drafts of SB 172 were passed around to school administrators before it was passed into law. School administrators used this version to augment their school's nutrition environment to comply with this early version of the bill. The earlier versions of the bill only applied to elementary schools in Kentucky. When the final version passed into law, it was amended to apply to all schools in Kentucky (not just elementary schools). This change in the policy was not communicated to school administrators, and has resulted in some schools failing to comply with the passed version of the law[26]. As my research discovered, this is the case in at least one particular school I visited. Middlesboro High School was offering non-compliant beverages (soft-drinks) 30 minutes after lunch, but still during the school operational day. This is in direct violation of the law. School administrators conveyed that their understanding of

[25] Interview with Michelle Coker; Fayette Co. Schools Food Service Director.
[26] From interview with Doris Cooper; Bell County Food Service Director.

the law was that the beverage standards only applied to elementary schools. In fact the regulations apply to all schools that receive meal reimbursement from the National School Lunch/Breakfast Program.

When SB 172 was in the drafting process, food service personnel conveyed that it would be too difficult to serve foods that met the bill's requirements and the requirements in the National School Lunch/Breakfast Program. For this reason, SB 172 was amended before it passed into law, to include a clause that exempted any food that met the requirements for the National School Lunch/Breakfast Program from the requirements of the bill. However, this exemption was also applied to a la carte items sold in the cafeteria. These items can be sold outside the requirements of SB 172 (see Finding V), as long as they are in compliance with the requirements of the National School Lunch/Breakfast Program. This exemption has not been advertised to schools in an attempt to adhere to the intent of the law. As Michelle Coker informed me, Paul McElwain only communicated that the schools should serve foods that are compliant with SB 172, and that schools should meet the spirit of the law in changing the nutrition environment in the schools. Most schools are unaware of this exemption, adding to the lack of communication in the legislation[27].

Edwards, III, addresses ambiguity in his writing. He argues that implementer non-compliance most often occurs when implementers do not know what they are expected to do. If schools are uncertain which parts of SB 172 apply to their schools, then these administrators in essence do not know specifically what is expected of them. For successful implementation to take place, it is necessary for implementers at all levels to have explicit knowledge (or means of obtaining) information about policy requirements.

IV. The financial burden of SB 172 has fallen squarely on the shoulders of the schools to implement.

Schools have lost precious discretionary funds from the changes in vending items and contracts in order to comply with the law. In my interview with Michelle Coker, the Fayette County School Food Service Director, she informed me that SB 172 has had a

[27] Interview with Michelle Coker; Fayette Co. Schools Food Service Director.

huge financial impact on the schools from the loss of vending funds. This money has traditionally been used for reward programs and field trips for students in the schools. As of the writing of this report, 2006/2007 district income in Fayette County Public Schools is down $59,877.09 compared to school year 2005/2006. Coker assessed FCPS vending income this year against lasts (before the implementation of SB 172) to arrive at this number.

Still other administrators informed me that the requirements of the law have impacted their discretionary funds. These schools traditionally received most of their discretionary funds from vending. Some schools have implemented alternative fund raising sources to compensate for the loss of revenue, but others have yet to try any alternative methods to raise money. The state made alternative fund raising ideas available on its website (KDE's website has links to these websites), which are more activity based, and tangible goods rather than food-based fund raising. Regardless, most schools surveyed lost money as a result of implementing the law respective to their prior funding from vending. This affected the operations in most of the schools surveyed. Of the schools surveyed, most administrators conveyed that the loss of funds has most impacted student field trips and assemblies. These were often used as educational rewards for students that performed well.

Mazmanian and Sabatier would argue successful implementation requires adequate funds for implementing agencies. This factor is not present in the implementation of SB 172. Schools bear the financial burden of implementing the nutrition standards as they have lost discretionary funds from vending contracts. In order to ensure successful implementation, it may be necessary for the state to provide interim financial compensation to the schools. Providing this temporary funding can assist the schools until they can adjust to the change in their funding levels.

V. There is a clause in SB 172 that allows a la carte items to be excluded from the law's regulations so long as the foods meet at least one of the requirements from the National School Lunch/Breakfast Program.

This loophole creates the possibility for schools to continue to offer unhealthy options in the school nutrition environment and defeats the purpose of the law as it was intended to regulate the foods offered outside the National School Lunch/Breakfast program. Essentially this law now only guides the sale of vending items and beverages. This exemption is not well-advertised to school administrators[28], but it is communicated by state officials that the intent of the law is to provide healthier options and food service directors should adhere to the spirit of the law when selecting items for sale in a la carte lines. This is also evidenced by KDE's list of food items that meet the criteria in Section 2 of 702 KAR 6:090; these items are offered for a la carte sale and vending machine options[29]. There is no formal means, however, to ensure that food service directors actually do this outside of the honor system.

Comparatively speaking, the requirements of the National School Lunch/Breakfast Program are less stringent than those of SB 172. In my interviews, one of the examples provided to me was the sale of donuts in the a la carte lines as it meets the enriched flour requirement in the federal program, yet is non-compliant with SB 172. The other example provided to me in my interviews was that the NSLP only requires juice to be 50% juice, while SB 172 requires 100%. Items sold a la carte then can meet the requirement of 50% juice, and avoid the much stricter 100% requirement[30]. The NSLP requires schools to offer nutrition under certain requirements (see attachment in the appendices that provides these requirements) for calories, vitamins, and minerals. The requirements of the NSLP are long, and very detailed (as evidenced from the literature the food service directors provided me), but from the opinions of the food service directors, these requirements are much less strict than the requirements of SB 172. Thus, allowing a la carte items to meet these less stringent requirements defeats the purpose of

[28] Interview with Michelle Coker; Fayette Co. Schools Food Service Director.
[29] Source: https:/kyeascn1.state.ky.us/nutrition/SB172/resources/snacks.pdf
[30] Interview with Michelle Coker; Fayette Co. Schools Food Service Director.

the law; the law is intended to set high nutrition standards for foods offered ***outside*** of the National School Lunch/Breakfast Program.

The format of the reporting for the National School Lunch/Breakfast Program requires that schools report nutrition information on a weekly average. Depending on the type of menu used by the schools (Traditional, Nutrient-based, Enhanced Nutrient-based), schools have the potential to serve two days of high calorie food and three days of lower caloric intake[31]. In at least one of the schools visited, this practice was occurring, and in an interview with one of the food service directors, I was informed that this practice happened on occasion in that particular school system[32]. Under the reporting standards for the schools this would balance out to meet the requirements of the National School Lunch/Breakfast Program as the days of lower caloric intake would offset the days of higher caloric intake. Schools average their nutritional content of their foods for an operational week, and not per day. This is how food service directors conveyed that it would be possible for schools to serve foods in the a la carte lines that did not meet the requirements of SB 172.

When performing my analysis, it was made clear to me why the exemption from SB 172 was allowed for school breakfast and lunches[33]. However, no one could explain to me why the exception was applied to the a la carte offerings. The best explanation that I received was from Michelle Coker, Fayette Co. Schools. She explained that in the schools, food offerings were in a controlled environment; serving sizes were not left to the students' discretion. Rather this discretion was left to the food service staff. She asserted that this system is much different from the "real world", where the only controls we have on portion size and fat content is our own discretion. Coker explained that offering these foods in such a controlled environment was no threat to the students' health, and that the law allowed schools to serve the occasional "treat".

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[31] From interview with Doris Cooper; Bell County Food Service Director.
[32] From Bell County High School site visit and Michelle Coker interview.
[33] From interview with Michelle Coker, Fayette Co. Food Service Director.

This exemption creates an inconsistent message to students; foods that are non-compliant with SB 172, but compliant with the requirements of the National School Lunch/Breakfast Program are suitable for consumption. This presents the wrong picture to students given the emphasis on healthy nutrition. Students may be uninformed about recommended foods for consumption to maintain a healthy lifestyle, and presenting a distorted message may hinder their understanding. In order to present a consistent message about what foods are suitable for a healthy diet, schools should consistently serve foods from the Dietary Guidelines for Americans (2005), and not foods offered in conflict with the regulations of SB 172 by way of the a la carte exemption. Using the donut example provided by one of the Food Service Directors, a single regular glazed Krispy Kreme doughnut contains 50% calories from fat, 20% above the guideline in SB 172 and the Dietary Guidelines for Americans (2005)[34]. Positive reinforcement of health-based principles requires schools to offer healthy foods consistently and not deviate from the requirements in SB 172 for a la carte items or for vending items as well.

The causal theory behind SB 172 is to change the foods offered during school operational times in order to create a healthy nutrition environment. Allowing the a la carte exemption to violate this causal theory violates one of the factors Mazmanian and Sabatier state is necessary for successful policy implementation (a sound, consistent causal theory). SB 172's causal theory asserts that by changing the nutrition environments in schools, children will be healthier and better informed about healthy food choices. This exemption presents the possibility of violating the causal theory if foods offered in the schools are not a healthy option or can tarnish the students' perception of healthy choices.

[34] For Krispy Kreme© nutritional information see: htt://www.krispykreme.com/doughnuts.pdf

Conclusions and Recommended Course of Action

This report makes the following recommendations to further improve the implementation of SB 172:

(1) The state should make an implementation model available to the school food service directors and school administrators.

This model should demonstrate an easy way to meet the law's requirements. An implementation "cookbook" would aid schools in creating a policy that is consistent with the requirements of SB 172. Any and all efforts the state can take to ease school transition should be taken. This model can identify necessary changes in the foods offered in the schools both in vending machines (snack and beverage), a la carte items, methods of food preparation, and methods to ensure stakeholder buy-in and involvement. A plan of this sort can identify necessary actions the school can take outside of what the law states, thus maximizing the chances of the policy successfully impacting the schools.

(2) Any successful schools' implementation strategy and their methods of implementation should be benchmarked by the states and made available to all schools in Kentucky.

The state should assess Kentucky's schools and determine which implementation plans are considered "best practices" in the state. These plans should be made available to other schools as an additional means to demonstrate how schools can transition into compliance with all the requirements of the policy. This information sharing can help disseminate different methods of creating a positive nutrition environment and emphasizing proper dietary nutrition for life in the school systems. There are schools in Kentucky that have gone beyond the requirements of SB 172 to implement programs and course study that teach nutrition education to the students to further solidify the effects of the program. These models should be made available so that schools have access to these resources in case they too identify a need to take further steps to address nutrition and education needs of their students. Once again, making successful practices and models

available to the schools will aid in schools transitioning into compliance with the regulations of SB 172 as well as alleviate any difficulty they may encounter in that transition.

(3) The state should create an office in the state department of education to assess schools' compliance with the regulations in the law. It should also communicate or create financial penalties and/or incentives to entice schools to comply with these regulations.

A board, agency, or supervising staff should be created or designated by the state (either Kentucky Department of Education or a governing board with expertise in nutritional practices) that will audit the schools' compliance with the regulations as well as assess any financial penalties for non-compliance. Financial penalties need to be created to put "teeth" into the legislation, and entice school administrators to comply with the regulations. Penalties need to be created and communicated to provide incentive for schools to comply with the regulations contained in the law. Without any penalties for violation, the law has "no legs to stand on", and may potentially be ignored by school administrators. Communication of these penalties needs to be performed in a uniform manner to all food service directors and school administrators to ensure that these key stakeholders understand the gravity associated with non-compliance with the policy.

(4) The state needs to clearly communicate the requirements of this law to schools through an office to remove any ambiguity that still exists in Kentucky's schools.

As mentioned in recommendation number 3, this created body needs to also communicate specifically the requirements of the law to the schools to ensure uniform compliance with the standards. This body can also communicate any changes that might be made to the law in future years, thus providing a practical and central place that school administrators can look towards for any clarification they desire. Communication is essential to ensure success of any policy, and this board would serve exactly that purpose. This governing body can remove any ambiguity in the requirements of the law that

currently exist in Kentucky's public schools, thus increasing the amount of schools that comply with SB 172.

(5) Lastly, the requirements established in SB 172 should be reworked so that a la carte items are no longer exempt from the regulations of the law if they meet the requirements in the National School Lunch/Breakfast Program.

As SB 172 is intended to create nutrition requirements for foods offered outside of the National School Lunch/Breakfast Program, it is essential that this law be amended to apply to a la carte items. The potential exists for schools to order and provide foods that are non-compliant with the policy and still provide an avenue for students to consume less than healthy foods. SB 172 sets strict standards for competitive foods in the schools, but exempts a la carte items from these strict standards for no obvious reason. Amending this exemption to govern a la carte items is necessary for schools to complete their health-based nutrition environment. Although there are few examples of unhealthy foods offered in the schools in the a la carte lines, the possibility still exists that these foods can be offered in the schools, and this possibility is detrimental to the intent of the law that creates health-based environments in schools.

Appendices to Report Table of Contents

Data Analysis for Report:

Supporting Documents for Report

Contact Information Matrix

School	Vending Machines (food)	Vending Machines (beverages)	A la carte sales	Level of compliance
Yellow Creek Elementary	None	Water	All foods from contract with local vendor are stipulated to meet the requirements of SB 172	Site visit and interview does not provide any information to make one think that this school is not in compliance with the requirements of the law
West End Elementary	None	Present, but according to administrator, are not to be patroned by students	All foods found met the requirements of SB 172.	With the exception of the beverage vending machine on the premises where student can access it, there was no information to make one think that this school was not in compliance with the requirements of the law.
Middlesboro High School	Present. Contained foods that met the requirements of the law. Operated in compliance with the competitive sale rule.	Water, milk, sports drinks, 100% juice, and soft drinks available. With the exception of the soft drinks, the beverages met the standards of SB 172 and the competitive sale rule. Water is also sold only 30 minutes after lunch, as administrators feel this is what the competitive sale rule requires.	All foods found met the requirements of SB 172.	The presence of the soft drink vending machines violates the requirements of SB 172. If this machine were operated after the end of the school day, it would meet requirements of the law.
Bell County High School	Present. Contained foods that met the requirement of the law. Operated in compliance with the competitive food rule as well.	Soft drink vending machines now only offer diet options. Soft drink vending machines and sports drink vending machines operate after school only and stop operation before the school day begins (as stipulated in the law). All other vending machines operate in compliance with the competitive sale rule. Water is available all day.	A la carte items (beverages and food items) are all compliant with SB 172. Most of the items found for sale were from the list of preapproved foods/snacks that meet the requirements of SB 172 and 7 KAR 6:090	Bell High's competitive food and beverage offerings are compliant with the requirements of SB 172. The only deviation I found was from the interview with the administrators where they informed me that the methods of food preparation have not changed; some of their foods served for lunch and breakfast are prepared in fattening manners and provide foods high in fat and saturated fat.
Bell Central Elementary	None	Soft drink vending machines located in the front of the school, but no beverages from this machine are allowed in school during operational hours. Students are not allowed to leave the building to purchase items during operational hours either. Sports drink vending machines operate after school, and water is available all day.	All items in the a la carte lines are from the preapproved list of compliant foods for SB 172 and 7 KAR 6:090. These items are sold in compliance with the competitive sale rule.	The violation of the beverage vending machine in the front of the building, but not with in the building itself, is considered "compliant" as staff supervise students upon entering the school to ensure the nutrition environment of the school remains consistent with the intent of SB 172. All other practices and offerings in the school provide no reason to think that this school is non-compliant with SB 172.

Pineville Elementary	None	Beverage vending machines are located in the lunchroom and operate during lunch periods to provide alternative sources of beverages to students. These beverages are limited to 100% fruit juice and water.	None	This school has an exceptional practice to comply with the requirements of SB 172. Interviews with administrators and site visit observations present no reason to think that this school is not compliant with the regulations of SB 172.
Pineville High School	Vending machines operate in compliance with the competitive sale rule. All items in the vending machines were changed to meet the requirements of SB 172 and come from the preapproved list of compliant foods for SB 172 and 7 KAR 6:090.	Beverages offered are sports drinks, water, and 100% juices. Water is sold all day, sports drinks are sold after school only, and the juices are sold in compliance with the competitive sale rule.	No a la carte items sold.	Items offered in the vending machines (food and beverage) are intended to be compliant with the regulations of SB 172. Sports drinks (that are not deemed appropriate for sale during school) are sold after school and in accordance with the regulations. As far as I can evidence from interviews with administrators and site visit observations, this school can be deemed compliant with the requirements of SB 172.
Corbin High School	All vending machines are compliant with SB 172 and 7 KAR 6:090. These items are also sold in compliance with the competitive sale rule. All snack items were changed to comply with these requirements. A majority of these items can be found in the preapproved list of snack foods that are compliant with the regulations.	All beverages offered in the school during operational hours are compliant with the regulations of SB 172 and 7 KAR 6:090. The beverages offered are water, 100% juice, and milk. After school operation, students are allowed to purchase sports drinks, coffee based beverages, and other concession items in the student café.	No a la carte items sold in the school	Corbin offers a great deal of services to its student population after school, thus these foods and beverages are exempt from the regulations of SB 172. During the school operational day, all foods and beverages sold meet the requirements of the law. For these reasons, as evidenced by interviews with school administrators and site visit observations, this school can be deemed compliant with the regulations of SB 172.
Johnson Elementary	None	None	None	As this school does not offer any food venues that will allow for non-compliance, and the schools receives its meals from Bryan Station High School, this school can be deemed compliant with the regulations of SB 172.
Ashland Elementary	Vending machines contain 100% juice. Students are allowed to purchase items from this machine the first Wednesday of every month.	None	Foods sold in the a la carte lines are compliant with the law and the majority of these items are from the preapproved lists of foods that meet the requirements of SB 172 and 7 KAR 6:090	Ashland offers foods for a la carte sale that are compliant with the requirements of SB 172, and vending items are also in compliance with these regulations. For these reasons, as evidenced by interviews with school administrators and site visit observations, this school can be deemed compliant with the regulations of SB 172.

Bryan Station High School	No vending machines yet as the school has yet to get a new vending contract since they moved school buildings.	No vending machines yet as the school has yet to get a new vending contract since they moved school buildings.	Items sold in the a la carte line are compliant with the law and the majority of their offerings are from the preapproved lists of foods that meet the requirements of SB 172 and 7 KAR 6:090	Given the current situation in Bryan Station High School, it is hard to assess the actual nutrition environment. Their school is still in transition from one building into the new high school. This has impacted the vending offerings and school store offerings, thus making the analysis difficult. However, the current nutrition environment does not present evidence to make one assume that the school is not compliant with the regulations. Once the school has had a chance to settle in, an additional nutritional analysis should be performed to reassess the nutrition environment and compliance with SB 172.
Tates Creek Elementary	No vending machines	No vending machines	Items sold in the a la carte line are compliant with the law and all food items come from the preapproved lists of foods that meet the requirements of SB 172 and 7 KAR 6:090. Beverages meet the requirements set forth in SB 172 as well (milk, water and juices).	No vending machines are present on the campus, and all a la carte items are intended to comply with the regulations of SB 172. For these reasons, as evidenced by interviews with school administrators and site visit observations, this school can be deemed compliant with the regulations of SB 172.

Food Service System Analysis

This was created from numerous documents, statutes, and interviews with food service directors and state officials.

The National School Lunch/Breakfast Program has strict requirements and a system of accountability that are already in place in the school systems in Kentucky and the nation. These requirements are the overarching requirements for all schools participating in the National School Lunch/Breakfast Program. The federal government has noted that states are at liberty to pass legislation, or take necessary steps, to implement the recommendations from the Center for Disease Control (CDC) to promote nutrition and physical activity.

There are a host of other laws and requirements that govern the foods, beverages, their nutrition standards, and the times they can be sold during the school day. Some of these are the WIC Reauthorization Act of 2004, 702 KAR 6:090, and the Competitive Sale Rule from 1990/1991. All of these requirements, included with Senate Bill (SB) 172, have created the new focus on healthy nutrition environments in schools, the most current and strict regulations coming SB 172.

The state of Kentucky passed SB 172 with the intent to place additional restrictions on the foods found in public schools. These restrictions call not only for strict guidelines for food and beverage offerings in public schools, but also requires a wellness policy be implemented in all schools that contain any combination of Kindergarten through fifth grade students. The WIC Reauthorization Act of 2004 goes a step further to require that all schools participating in the National School Lunch/Breakfast Program implement some sort of wellness policy (elementary, middle, and high schools).

The requirements contained in SB 172 strictly govern the foods offered and the beverages offered in Kentucky's public schools. These restrictions made it difficult for cafeteria staff to provide foods for the school breakfast and lunch program. For this reason, during the bill's creation, clauses were added to the bill that would allow foods that met the National School Lunch/Breakfast Program requirements to be exempt from the requirements of SB 172. This would allow schools to provide healthy meals to students, while at the same time alleviating the problems that the stricter requirements from SB 172 would cause on food service staff. However, as the bill was being further amended, a clause was added into the regulations that would exempt a la carte items from SB 172's requirements if these items also met the National School Lunch/Breakfast Program guidelines. This would allow schools to potentially sell unhealthy foods so long as the foods met one of the federal guidelines in the NSLP. The example provided to me by one food service director was that of a donut. Donuts do not meet the requirements of SB 172; however they meet the NSLP requirement of enriched flour or the bread component.

There are three different types of menu planning available to food service directors. These are the Traditional Food Based, Enhanced Food Based, and Nutrient Standards Menu options for creating school meal menus. These menu options allow food service directors to meet the requirements of the National School Lunch and Breakfast Program with three different avenues. The Traditional menu focuses more on providing foods to children within the basic calorie needs of each age group. The Nutrient Standards menu focuses more on providing a greater amount of nutrients to students (iron, Vitamin A, Vitamin C, etc.) compared to the Traditional menu. The Enhanced Food menu offers the most nutrient rich foods for students. All three have different breakdowns for requirements per age group. The Traditional menu has the greatest breakdown, including groups for preschool age children, grades K-3, and grades 4-12. The Enhanced menu

has more of a traditional grade breakdown, with a group for preschool children, grades K-6, and another grouping for grades 7-12. The requirements for these grades are all averaged over the week. This would mean that all nutrition information kept on file is summed and averaged over the course of the school week (typically 5 days given certain exceptions). As one food service director illustrated, this is how schools can potentially serve donuts in the a la carte offerings. They can have two days of high caloric intake, and then average it out with three days of lower caloric intake. These schools will still meet requirements of the law, but do so by manipulating the nutrition data. This particular food service director noted this pitfall, and recommended the only way to prevent this from happening is to change from weekly average statistics to daily statistics.

Food Service Directors (FSD) in the school districts I visited create the menus on some established time frame (monthly, biweekly, triweekly) for distribution to the school's cafeteria manager. The FSD uses the National School Lunch/Breakfast requirements and menu planning options (listed above) to create the schools' menus. FSDs also identify food vendors that the schools will purchase their foods from to make their daily meals. They compile lists of foods that meet the requirements of the NSLP and SB 172 for purchase by the schools. These lists are then sent to school cafeteria managers, and they order to supplies and schedule delivery dates. There is little leeway for cafeteria managers and staff to deviate from these menus and pre-selected foods. FSDs will supervise the cafeteria managers, work with the schools to ensure compliance with regulations, and at times talk with students to assess their opinions on the foods, and other steps the school food service department can take to make the meals more enjoyable.

According to one particular interview I obtained, FSDs are also required by SB 172 to assess the physical activity environments in the schools. It puts additional burden on the FSDs in the school systems. SB 172 requires that nutrition and physical activity assessments be performed in the districts, but not on the individual school level. These reports are compiled from data collected from each individual school that are submitted by the school's principals. The information is compiled for the district, and reflects the average nutritional value for the school's meals, how many students participated in the National School Lunch/Breakfast Program, and the physical fitness activity in these respective school districts. These report cards are submitted to the Kentucky Department of Education (KDE) and are sent home to parents via the students. There is a move to make these report cards available online for all school districts in Kentucky.

Cafeteria managers (CM) are in charge of supervising the day-to-day operations in the schools. They are in charge of staffing, ensuring proper preparation of foods, temperature monitoring, facility cleanliness, and maintaining production records. These production records contain vital information that the schools use to apply for federal reimbursement from the NSLP. These records contain information like the amount of students served, nutrition information, ingredients, recipe numbers (from preset lists of recipes), and food temperature readings. These records are used for auditing food services to determine if schools and districts are compliant with governing regulations. Schools are audited by the federal government every five years with a Coordinated Review Effort (CRE), which is designed to be an all-encompassing review of the food services in the district. If schools are found to have violated any requirements in the NSLP, they are required to refund any reimbursement the federal government provided for the day in violation. This provides financial disincentive to comply with the regulations of the NSLP.

However, there is no real incentive or disincentive (measure of accountability) to comply with the requirements of SB 172. As this policy is a state measure to control the nutrition environment, and the NSLP is a federal program, no financial incentives/disincentives are tied yet with the law. KDE official Paul McElwain conceded this point that there was no level of accountability to

encourage schools to comply with SB 172. Every food service director, when asked about any accountability measures, only mentioned the reimbursement incentive to comply with the NSLP requirements. However, through these interviews, it became evident that there was a lack of communication as to what violation of the requirements of SB 172 would entail. One said that no incentives or disincentives existed outside of the federal program; another said that the requirements of SB 172 were also enforced through return of federal meal reimbursement, and another said that return of federal meal reimbursement would be a next step to ensure compliance in future years.

Meal reimbursements for the schools come indirectly from the federal government. Money for the NSLP comes from the federal government to the state government. This money is housed there, and schools submit food service records online to begin the process for reimbursement. These records act as requests for reimbursement, and when submitted online, begin the reimbursement process. The actual reimbursement comes from the state that was provided by the federal government. The state receives and holds this money while at the same time auditing the schools' compliance with the NSLP requirements. The states have more of a role in auditing the schools as they are in a better position to audit every public school in their respective states compared to the federal government's Department of Education.

Kentucky and the NSLP require schools use a "offer versus serve" format in providing meals. The offer versus serve requires that schools offer a minimum of five different menu items, and that students are required to be served or serve themselves at least 3 of those items for the meal to count as a reimbursable meal. If a meal does not have 3 items, it does not count as a "full meal" and is not eligible for federal reimbursement. The schools however normally do not ensure that these 3 items are actually consumed by the students.

Menu Format Options for Schools and Nutrition Requirements under the NSLP

These charts were duplicated from the requirements for the National School Lunch and National School Breakfast program subsection 210.10 governs the Lunch program and Subsection 220.8 governs the Breakfast Program. Note: RDA stands for Recommended Daily Allowance.

Minimum Nutrient and Calorie Levels for School Lunches Nutrient Standard Menu Planning Approaches (School Week Averages)				
	Minimum Requirements			Optional
Nutrients and Energy Allowances	Preschool	K-8	Grades 7-12	Grades K-3
Energy allowances (calories)	517	664	825	633
Total fat (as a percentage of actual total food energy)	See section 1	See section 1 and 2	See section 2	See sections 1 and 2
Saturated fat (as a percentage of actual total food energy)	See section 1	See section 1 and 3	See section 3	See sections 1 and 3
RDA for protein (g)	7	10	16	9
RDA for calcium (mg)	267	286	400	267
RDA for iron (mg)	3.3	3.5	4.5	3.3
RDA for Vitamin A (RE)	150	224	300	200
RDA for Vitamin C (mg)	14	15	18	15

Section 1: The Dietary Guidelines recommend that after 2 years of age "…children should gradually adopt a diet that, by about 5 years of age, contains no more than 30 percent of calories from fat."
Section 2: Not to exceed 30 percent over a school week.
Section 3: Less than 10 percent over a school week.

Optional Minimum Nutrient and Calorie Levels for School Lunches Nutrient Standard Menu Planning Approaches (School Week Averages)				
Nutrients and Energy Allowances	Ages 3-6	Ages 7-10	Ages 11-13	Ages 14 and above
Energy allowances (calories)	558	667	783	846
Total fat (as a percentage of actual total food energy)	See sections 1 and 2	See section 2	See section 2	See section 2
Saturated fat (as a percentage of actual total food energy)	See sections 1 and 3	See section 3	See section 3	See section 3
RDA for protein (g)	7.3	9.3	15.0	16.7
RDA for calcium (mg)	267	267	400	400
RDA for iron (mg)	3.3	3.5	4.5	4.5
RDA for Vitamin A (RE)	158	233	300	300
RDA for Vitamin C (mg)	14.6	15	16.7	19.2

Section 1: The Dietary Guidelines recommend that after 2 years of age "…children should gradually adopt a diet that, by about 5 years of age, contains no more than 30 percent of calories from fat."
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Section 3: Less than 10 percent over a school week.

Minimum Nutrient and Calorie Levels for School Lunches Traditional Food-Based Menu Planning Approaches (School Week Averages)				
	Minimum Requirements			Optional
Nutrients and Energy Allowances	Group II: Preschool Ages 3-4	Group III: K-3 Ages 5-8	Group IV: Grades 4-12 Ages 9 +	Group V: Grades 7-12 Ages 12 +
Energy allowances (calories)	517	633	785	825
Total fat (as a percentage of actual total food energy)	See section 1	See section 1 and 2	See section 2	See section 2
Saturated fat (as a percentage of actual total food energy)	See section 1	See section 1 and 3	See section 3	See section 3
RDA for protein (g)	7	9	15	16
RDA for calcium (mg)	267	267	370	400
RDA for iron (mg)	3.3	3.3	4.2	4.5
RDA for Vitamin A (RE)	150	200	385	300
RDA for Vitamin C (mg)	14	15	17	18

Minimum Nutrient and Calorie Levels for School Lunches Enhanced Food-Based Menu Planning Approaches (School Week Averages)				
Nutrients and Energy Allowances	Preschool	Grades K-6	Grades 7-12	Grades K-3
Energy allowances (calories)	517	664	825	633
Total fat (as a percentage of actual total food energy)	See section 1	See sections 1 and 2	See section 2	See sections 1 and 2
Saturated fat (as a percentage of actual total food energy)	See section 1	See sections 1 and 3	See section 3	See sections 1 and 3
RDA for protein (g)	7	10	16	9
RDA for calcium (mg)	267	286	400	267
RDA for iron (mg)	3.3	3.5	4.5	3.3
RDA for Vitamin A (RE)	150	224	300	200
RDA for Vitamin C (mg)	14	15	18	15

Section 1: The Dietary Guidelines recommend that after 2 years of age "…children should gradually adopt a diet that, by about 5 years of age, contains no more than 30 percent of calories from fat."
Section 2: Not to exceed 30 percent over a school week.
Section 3: Less than 10 percent over a school week.

There are additional guidelines from the National School Lunch and Breakfast program that are not included in this document. These additional guidelines were gathered from interviews with school food service directors, but I was unable to obtain quantifiable numbers for analysis.
The National Lunch and Breakfast Program requires that one-third of the Recommended Dietary Allowances (RDA) for protein, calcium, iron, vitamin A and vitamin C in the appropriate levels for the ages/grades depending on the menu planning approach used to create school menus.

Summary of requirements from different state policies, documents, and laws from SB 172

Document 1:
From: 42 USC 1751 sec. 204. LOCAL WELLNESS POLICY

Each local educational agency participating in a program authorized by the Richard B. Russell National School Lunch Act (42 USC 1751 et seq) or the Child Nutrition Act of 1966 (42 USC 1771 et seq) [both of which make up the National School Lunch and Breakfast Program] shall establish a local wellness policy for schools under the local educational agency (board of education) that addresses the following:

- Nutrition guidelines in schools for all foods available on each campus during the school day.
- Establishing a board that is to hold schools accountable for the application of the school's wellness policy.
- Will involve parents, students, representatives of the school food authority, school board, school administrators, and the public in creation of this wellness policy.

Additionally, included in this law are stipulations that the federal government will provide assistance to the local schools to establish a healthy school nutrition environment, reduce childhood obesity, and prevent diet-related chronic diseases. The federal government will also make available models of successful programs and implementation of healthy options in the schools (benchmarkable schools), and work with schools to ensure that the policy is implemented in a manner that is consistent with the needs and requirements of the local educational agency.

Document 2:
702 KAR 6:090. Minimum nutritional standards for foods and beverages available on public school campuses during the school day; required nutrition and physical activity reports

Requires the Kentucky Board of Education (KY BOE) to promulgate an administrative regulation that specifies the minimum nutrition standards for all foods and beverages that are sold outside the National School Breakfast and National School Lunch programs, whether in vending machines, school stores, canteens, or a la carte cafeteria sales (sale venues).

Section 1 guides beverage standards and their vending times. The vending time is to begin no less than 30 minutes after the last lunch period until the end of the last instructional period. Any beverage offered for sale through a sale venue (listed above) shall be a

- Fluid unflavored or flavored milk that is no more than 1% milk fat
- Plain or flavored water, non-caloric, noncarbonated water
- 100% fruit of vegetable juice or any combination of both totaling 100% or
- Any beverage that contains no more than 10 grams of sugar per serving, except this limit shall not apply to 100% fruit or vegetable juice or any combination equaling 100%

Beverages shall not exceed the volume size of 17 ounces except for plain or flavored, non-caloric, noncarbonated water or for sales to middle school or high school students (defined by grades 6 through 12), the volume size of the beverage shall not exceed 20 ounces.

Section 2 guides the food regulations and the vending times. 30 minutes after the last lunch period until the end of the last instructional period, a food item offered for sale through a sale venue (listed above) shall meet the following standards:

- Calories from fat must be less than or equal to 30% of total calories of the items. Exceptions: reduced fat cheese, nuts, seeds, nut butters.
- Calories from saturated fat must be less than or equal to 10% of total calories
- Sugar grams must be less than or equal to 32% of total weight with a ceiling of 14 grams (except for fresh, frozen, canned or dried fruits and vegetables)
- Milligrams of sodium per serving is less than or equal to 300 in chips, cereals, crackers, baked goods, and other snack food items
- Milligrams of sodium is less than or equal to 450 in pastas, meats, and soups
- Milligrams of sodium is less than or equal to 600 in pizza, sandwiches, and main dishes
- The portion/pack size for chips, crackers, popcorn, cereal, trail mix, nuts, seeds, or jerky is less than of equal to 2 ounces
- The portion/pack size for cookies is less than or equal to 1 ounce
- The portion/pack size for cereal bars, granola bars, pastries, muffins, doughnuts, bagels or other bakery-type items is less than or equal to 2 ounces
- The portion/pack size for non-frozen yogurt is less than or equal to 8 ounces
- The portion/pack size for dessert items, including low-fat (1% milk fat) or fat free ice cream, frozen fruit juice bars, or other real fruit items is less than or equal to 4 ounces

A la carte items served in the cafeteria during the serving of breakfast or lunch shall meet the following standards:

- Beverages shall meet the standards of section 1 of this administrative regulation
- Food items shall meet the standards established in section 2 of this administrative regulation, ***except schools may offer for a la carte sale any item that is creditable under the School Breakfast or National School Lunch Program meal patterns as set forth in 7 CFR 220.8 and 210.10, respectively.*** (220.8 and 210.10 are referenced later in this document; 220.8 applies to the National School Breakfast Program, and 210.10 applies to the National School Lunch Program)

Section 5 spells out the requirements for the Local District Nutrition Program Report. A local food service director of the local district should complete this report. He/she shall assess the nutrition program required under KRS 158.856 and issue this report every year either by posting it to the district web site or submitting the report to the Kentucky Department of Education by May 1st of every year.

This report is created on the district level and not on the individual school level.

Document 3:

Kentucky Board of Education Board Notes, Volume 13, No. 4 Report of the August 3-4, 2005, Regular Meeting. "Board Approves 702 KAR 6:090, Minimum Nutrition Standards for Foods and Beverages Available on Public School Campuses During the School Day"

702 KAR 6:090 requires the KY BOE to promulgate an administrative regulation specifying "the minimum nutrition standards for all foods and beverages that are sold outside the National School Breakfast and National School Lunch programs, whether in vending machines, school stores, canteens, or a la carte cafeteria sales".

The board continues to note the beverage and food requirements of the law that are discussed in the summary of document 2, also contained in this document above. The board also includes the stipulation about a la carte sales for beverages and foods noting the exception outlines in the summary of document 2 contained in this document above that reads, "schools may offer for a la carte sale any item that is creditable under the School Breakfast and National School Lunch Program meal patters".

Document 4:
Frequently Asked Questions regarding Senate Bill (SB) 172

This document can be located on the Kentucky Department of Education Nutrition and Health Services web page and is intended to be a resource to school administrators on what the bill requires them to do. It can be accessed using the following URL:
http://www.education.ky.gov/KDE/Administrative+Resources/Nutrition+and+Health+Services/
or www.education.ky.gov/users/jneal/SB**172**/FAQ_SB**172**.pdf

Question 1 discusses the provisions of SB 172 and where to find them. This question provides references for the penalties for violating the competitive food sales provisions, deals with access to contracted fast foods, qualifications of school food service directors, stipulates what is required in the assessment and reports of the nutrition and physical activity environments in the schools, as well as they physical activity policies in the K-5 schools.

Question 2 specifies that the *districts* annually assess the nutrition and physical activity environments, report these results to parents, local board members and school council members, as well as make recommendations to improve these environments.

Question 3 designates what local school boards should do with regards to SB 172. Local boards should discuss findings of the nutrition and physical activity reports and solicit public comment on those reports. Boards should annually present improvement plans for these environments.

Question 4 addresses how the district assesses the nutrition and physical activity environments. KDE provides an assessment tool to use if the district desires. If this tool is not used, the district may use any other tool it is comfortable with to conduct the assessments. KDE has provided every school district food service director a CD-ROM that contains the standards and indicators for School Nutrition Programs and Module 3 of the School Health Index that deals with Physical Education and other Physical Activity Programs.

Question 5 addresses the type of reports that must be issued and any particular format that may be required. The report must include:

- An evaluation of the district's compliance with the school breakfast program and lunch programs and the availability of contracted fast food
- A review of access to foods and beverages sold outside the school lunch and breakfast programs whether through vending machines, school stores, canteens, or as a la carte items on the cafeteria lines
- A list of foods and beverages that are available to students including the nutritional value of those foods and beverages
- And the recommendations for improving the school nutrition environment

There is no guidance offered by the state on the report pertaining to the physical activity environment. No particular report format is required, only the addressables.

Question 7 addresses when reports have to be issued. The document provides guidance that the report should be used by November 30 of each year. There is no deadline for the 2005/2006 school year, but the November deadline is enforced for the 2006/2007 school year.

Question 8 addresses what SB 172 requires schools to actually do to be compliant with the law. Several things are required:

- ***All schools*** will abide by the nutritional standards for foods and beverages that are in the administrative regulation unless a waiver is sought and granted. These are found in KRS 158.854.
- ***All schools*** will have to abide by the provisions of the competitive food sales regulations.
- ***Elementary schools*** will have to abide by the beverage standards in KRS 158.854(4).
- ***School containing K-5, or any combination thereof***, must adopt and implement what KRS 160.345(11) refers to as a "local wellness policy" that provides daily moderate to vigorous physical activity for students and encourages healthy choices. If they desire, schools may use up to 30 minutes of the instructional day to provide physical activity.
- Principals in the schools containing K-5 or any combination thereof must annually assess each student's level of physical activity.

Please note that there is ambiguity in the guidance provided in this question and answer for administrators. The first two requirements stipulate all schools, but the third requirement only addresses elementary schools, which can lead some administrators to think that the beverage standards only apply to elementary school students.

Document 5:
Requirements of SB 172 from the Unofficial Copy of the Bill as of 3/12/2007

Beverages:

- Milk 1% or less milk fat
- Plain or flavored water (non-carbonated)
- 100% fruit/vegetable juice
- Beverage with no more than 10 g of sugar per serving
- Volume size 17 ounces, 20 ounces high school, except for water
- Diet soft drinks allowed 30 minutes after lunch
- Sports drinks allowed 30 minutes after lunch

Food Standards:

- Calories from fat must be less than or equal to 30% of total calories of the items. Exceptions: reduced fat cheese, nuts, seeds, nut butters.
- Calories from saturated fat must be less than or equal to 10% of total calories
- Sugar grams must be less than or equal to 32% of total weight with a ceiling of 14 grams (except for fresh, frozen, canned or dried fruits and vegetables)
- Milligrams of sodium per serving is less than or equal to 300 in chips, cereals, crackers, baked goods, and other snack food items

- Milligrams of sodium is less than or equal to 450 in pastas, meats, and soups
- Milligrams of sodium is less than or equal to 600 in pizza, sandwiches, and main dishes
- The portion/pack size for chips, crackers, popcorn, cereal, trail mix, nuts, seeds, or jerky is less than of equal to 2 ounces
- The portion/pack size for cookies is less than or equal to 1 ounce
- The portion/pack size for cereal bars, granola bars, pastries, muffins, doughnuts, bagels or other bakery-type items is less than or equal to 2 ounces
- The portion/pack size for non-frozen yogurt is less than or equal to 8 ounces
- The portion/pack size for dessert items, including low-fat (1% milk fat) or fat free ice cream, frozen fruit juice bars, or other real fruit items is less than or equal to 4 ounces

Summary of the 2005 Dietary Guidelines for Americans

These guidelines from the plan deal only with nutrition and recommended amounts of dietary nutrients.

Background:

This provides science-based advice that is used to promote health and to reduce the risks of major chronic diseases through diet and physical activity. Combined with physical activity, following a diet that does not provide excess calories according to this plan's recommendations should enhance the health of most individuals. This document is revised every 5 years to remain current and account for any new scientific information provided by the Dietary Guidelines Advisory Committee (DGAC) that is appointed by the Secretaries of the US Department of Health and Human Services (DHHS) and the US Department of Agriculture (USDA). This document's intent is to summarize and synthesize knowledge regarding individual nutrients and food components into recommendations for a pattern of eating that can be adopted by the public. Key recommendations are grouped under nine inter-related focus areas. Throughout most of this publication, examples use a 2,000 calorie level as a reference for consistency with the Nutrition Facts Panel. This recommended level will change based on age, gender, and activity levels. The recommendations made in this document apply to Americans over 2 years of age.

Recommendations:

Food Groups to Encourage

Consume sufficient amounts and a variety of fruits and vegetables while staying within energy needs. Two cups of fruit and two and a half cups of vegetables per day are recommended for a reference 2,000 calorie intake, with higher or lower amounts depending on the calorie level.

Consume 3 or more ounce-equivalent of whole-grain products per day, with the rest of the grains coming from enriched or whole-grain products.

Consume 3 cups per day of fat-free or low-fat milk or equivalent milk products.

Key recommendations for children or adolescents: consume whole-grain products often; at least half the grains consumed should be from whole-grains. Children ages 2 through 8 should consume 2 cups per day of fat-free or low-fat milk or equivalent milk products. Children 9 years of age and older should consume 3 cups per day of fat-free or low-fat milk or equivalent milk products.

Fats

Consume less than 10% of calories from saturated fatty acids and less than 300 mg/day of cholesterol, and keep trans-fatty acid consumption as low as possible.

Keep total intake between 20 and 35 percent of calories, with most fats coming from sources of polyunsaturated and monosaturated fatty acids, such as fish, nuts, and vegetable oils.

When selecting and preparing meat, poultry, dry beans, and milk or milk products, make choices that are lean, low-fat, or fat-free.

Limit intake of fats and oils high in saturated and/or trans-fatty acids, and choose products low in such fats and oils.

Key recommendations for children and adolescents: Keep total fat intake between 30 and 35 percent of calories for children between the ages of 2 and 3 and between 25 to 35 percent of calories for children and adolescents 4 to 18 years of age, with most fast coming from sources of polyunsaturated and monosaturated fatty acids, such as fish, nuts, and vegetable oils.

Carbohydrates

Choose fiber-rich fruits, vegetables, and whole grains often.

Choose and prepare foods and beverages with little added sugars or caloric sweeteners, such as amounts suggested by the USDA Food Guide and the Dietary Approach to Stop Hypertension (DASH) Eating Plan.

Sodium and Potassium

Consume less than 2,300 mg (approximately 1 tsp of salt) of sodium per day.

Chose and prepare foods with little salt. At the same time, consume potassium-rich foods, such as fruits and vegetables.

Guidelines for Competitive Food and Beverage Sales

KRS 158.854 requires the Kentucky Board of Education to adopt an administrative regulation that sets minimum nutritional standards for food and beverage items that are offered for sale through vending machines, school stores, canteens and as a la carte items on the cafeteria lines.

The law also stipulates that the sales from vending machines, stores and canteens; those sales in competition with the school breakfast and lunch programs, cannot take place from the time of the arrival of the first students in the morning until 30 minutes after lunch.

The Board of Education has adopted a regulation containing the required standards. That regulation is 702 Kentucky Administrative Regulation (KAR) 6:090. It contemplates three "windows" of time during the school day.

- The first "window" opens when the first child arrives in the morning and closes 30 minutes after lunch. While this "window" is open, no sales of <u>any</u> food or beverage item may take place except as part of the school breakfast or lunch program.
- The second "window" opens at 30 minutes after lunch and closes at the end of the last instructional period. While this "window" is open, vending machines, school stores and school canteens, etc., may sell food and beverage items that meet the standards in the regulation.
- The third "window" opens at the close of the last instructional period in the afternoon and closes at the arrival of the first student on the following morning. While this third "window" is open, there are no nutrient standards restricting what may be sold.

<u>Beverage Offerings</u>
The regulation requires that beverages sold through vending machines, school stores, canteens or as a la carte items on the cafeteria lines are restricted to:

1. Plain or flavored milk containing no more than 1% milk fat (that is, 1% or skim);
2. Plain or flavored, non-carbonated water containing zero calories;
3. 100% fruit or vegetable juice or any combination equaling 100%;
4. Any other beverage containing no more than 10 grams of sugar per serving; and
5. The volume size is limited to 17 ounces in elementary schools/20 ounces in middle and high schools, except for water.

These standards apply to beverages available as a la carte items on the cafeteria line during breakfast and lunch (while the first "window" is open) as well as beverages made available through the machines and stores from 30 minutes after the last lunch period until the end of the last instructional period (when the second "window" opens). The standards are the same for elementary, middle and high schools with the one exception of volume size. The Kentucky Board of Education <u>strongly</u> encourages all middle and high schools to offer the smaller volume beverages.

What will be different? These standards will not allow the sale of regular soft drinks or regular sports drinks (Gatorade/PowerAde/All Sports) until after school. Those of you who offer the regular "sports" drinks as a la carte items on the cafeteria line will have to replace those with the low calorie "sports" drinks. The machines and stores may still offer diet soft drinks and the low calorie sports drinks. No juice "drinks" until after school. Milk vending machines, stores, etc., must offer only 1% or skim. Bottled water offerings cannot contain calories. Again, these

restrictions do apply to beverages that are offered for a la carte sale on the cafeteria lines during breakfast and lunch.

There are no restrictions on what may be sold after the end of the last instructional period (when the third "window" opens).

Food Offerings

While the first "window" is open, sales are limited to those conducted as part of the school breakfast and lunch programs and schools may offer for a la carte sale on the cafeteria line any item that meets the following standards:

1. Calories from fat are limited to no more than 30% of total calories; [exceptions: reduced fat cheese (2%), nuts, seeds, nut butters];
2. Calories from saturated fat are limited to no more than 10% of total calories;
3. Grams of sugar are limited to no more than 32% of total weight with a ceiling of 14 grams (exceptions: fresh, frozen canned or dried fruits and vegetables);
4. Milligrams of sodium per serving are limited to 300 in chips, cereals, crackers, baked goods and other snack items;
5. Milligrams of sodium per serving are limited to 450 in pastas, meats and soups;
6. Milligrams of sodium per serving are limited to 600 in pizza, sandwiches and main dishes;
7. The portion/pack size for chips, crackers, popcorn, cereal, trail mix, nuts, seeds or jerky is limited to 2 ounces;
8. The portion/pack size for cookies is limited to 1 ounce;
9. The portion/pack size for cereal bars, granola bars, pastries, muffins, doughnuts, bagels or other bakery-type items is limited to 2 ounces;
10. The portion/pack size for non-frozen yogurt is limited to 8 ounces; and
11. The portion/pack size for frozen dessert items, including low fat (1% milk fat) or fat free ice cream, frozen fruit juice bars, or frozen real fruit items is limited to 4 ounces.

In addition, schools may offer for a la carte sale any item that can be part of a reimbursable breakfast or lunch, according to the federal meal pattern regulations.

When the second "window" opens, schools may offer for sale through vending machines, stores, canteens, etc., food items that meet the following standards:

1. Calories from fat are limited to no more than 30% of total calories; [exceptions: reduced fat cheese (2%), nuts, seeds, nut butters];
2. Calories from saturated fat are limited to no more than 10% of total calories;
3. Grams of sugar are limited to no more than 32% of total weight with a ceiling of 14 grams (exceptions: fresh, frozen canned or dried fruits and vegetables);
4. Milligrams of sodium per serving are limited to 300 in chips, cereals, crackers, baked goods and other snack items;
5. Milligrams of sodium per serving are limited to 450 in pastas, meats and soups;
6. Milligrams of sodium per serving are limited to 600 in pizza, sandwiches and main dishes;
7. The portion/pack size for chips, crackers, popcorn, cereal, trail mix, nuts, seeds or jerky is limited to 2 ounces;
8. The portion/pack size for cookies is limited to 1 ounce;
9. The portion/pack size for cereal bars, granola bars, pastries, muffins, doughnuts, bagels or other bakery-type items is limited to 2 ounces;
10. The portion/pack size for non-frozen yogurt is limited to 8 ounces; and

11. The portion/pack size for frozen dessert items, including low fat (1% milk fat) or fat free ice cream, frozen fruit juice bars, or frozen real fruit items is limited to 4 ounces.

The item must meet all of the criteria or it cannot be sold. A list of some allowable items is available on our website at https://kyeascn1.state.ky.us/nutrition/default.asp

When the third "window" opens, schools may offer any item they choose in vending machines, school stores, canteen, etc.

Schools will have to take a look at what is in the vending machines and stores to see if those items meet the criteria. The Commissioner has decided that districts should have a transition period to meet these new requirements. That information has been transmitted to districts via a memo from the Commissioner.

I hope this explains where we are in terms of the new regulation.

New Assessment and Reporting Requirements

KRS 158.856 requires that districts assess the nutrition environment in the district as well as the physical activity environment in the district. The Department of Education has provided assessment instruments that districts may use to conduct those assessments. Those assessments must result in a written report issued to local board members, council members and parents.

The report on the nutrition environment must address:

- Compliance with the School Breakfast Program and National School Lunch Program;
- The availability of contracted fast foods;
- A review of access to foods and beverages sold through vending machines, school stores, etc.;
- A list of foods and beverages available to students, including the nutritional value of each; and
- Recommendations for improving the nutrition environment.

The statute is silent with respect to what must be addressed in the report on the physical activity environment. The Department has provided a suggested reporting format that includes the elements in the statute, except for recommendations for improvement.

The statute requires that each local board discuss the findings of each of the reports, solicit public comment regarding the findings and recommendations in the reports and, on or before January 31 of each year, present a plan to improve the nutrition and physical activity environments in the district.

The Department strongly recommends that this plan be integrated into the Comprehensive District Improvement Plan and monitored just as the other elements of that plan are monitored.

The benchmarking, reporting, comment soliciting, presenting a plan to improve the nutrition and physical activity environments, integrating into and monitoring of the plan through the

Comprehensive District Improvement Plan process will also enable districts to meet the requirements of the Child Nutrition and WIC Reauthorization Act of 2004. Section 204 of that federal act requires districts to adopt "local wellness policies" for the schools in the district. Those policies must, at a minimum, address nutrition education (certainly a subject that should be a strategy in the plan presented by the local board pursuant to KRS 158.856), physical activity (certainly a subject addressed in the plan required by KRS 158.856) and nutrition standards for food and beverages available on the school campuses of the district (an element of the report on the nutrition environment required by KRS 158.856).

This way districts won't have separate federal and state plans being developed and monitored and the chaos that would result. The Department will be amending the district assurances, where necessary, to include the requirements of the federal and state language.

Finally, KRS 160.345(11) requires that schools containing grades K-5, or any combination thereof, implement what it unfortunately refers to as "local wellness policies" that provide for moderate to vigorous physical activity daily for students. These "local wellness polices" are not to be confused with, but as they relate to physical activity could be substituted for, the "local wellness policies" referred to by the federal language and referenced earlier. If the school would like, the school may use up to 30 minutes of the instructional day to provide for physical activity for the students. The Kentucky Association for School Councils has developed sample policy language that meets the requirements of this statute. The school is also required to annually assess each child's level of physical activity. The Department has provided a spreadsheet format that schools may use for this purpose.

Resources that corroborate identified problems with school-based nutrition programs

When researching studies of the effectiveness of school-based prevention programs, three particular reports were of importance to the issue of this report. These reports came from Veugelers and Fitzgerald[35], the Texas Legislative Commission Research Division[36] (Prepared by Lisa Kalakanis and Benjamin Moulton), and the Government Accountability Office[37]. These reports have been summarized, along with their findings in order to add to the information base of this report; little is known about the effectiveness of these programs. Past research has been unable to determine if these programs are successful or not in preventing obesity in school-age children, or if they have a lasting effect into adulthood. The findings from these reports are summarized in the following passage.

Veugelers and Fitzgerald studied the effects of school programs in regard to preventing excess body weight, improving dietary quality, and increasing physical activity. They surveyed 5200 grade 5 students in 2003 along with parents and school principals. They recorded student height and weight, dietary intake, and collected information on physical activity and sedentary activities. They compared body weight, diet and physical activity across schools with and without nutrition programs using multilevel regression methods while adjusting for gender and socioeconomic characteristics of parents and residential neighborhoods.

Veugelers and Fitzgerald used the Children's Lifestyle and School-Performance Study (CLASS) in 2003 and administered the survey to a large grouping of 5th grade students, their parents, and school principals. Of the 291 schools in Nova Scotia with 5th grade classes, 282 (96.9%) participated by completing a short survey and distributing a consent

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[35] Effectiveness of School Programs in Preventing Childhood Obesity: A multilevel comparison
By Paul J Veugelers, PhD and Angela L. Fitzgerald, MSc

[36] School-Based Interventions for Childhood Obesity
Prepared by Lisa Kalakanis and Benjamin Moulton
From the Texas Legislative Council Research Division, October 2006

[37] Government Accountability Office (GAO) Report on Childhood Obesity and the School Meals Program
GAO 05-563, Report Issue Date; August 8th, 2005

form and questionnaire to parents of all 5th grade students. Parental consent was obtained for 5517 students, and this resulted in an average response rate of 51.1% per school. CLASS representatives visited these schools to administer a modified version of the Harvard Youth Adolescent Food Frequency Questionnaire (YAQ), survey physical and sedentary activity, as well as record the heights and weights of participating students to calculate Body Mass Index (BMI).

They assessed excess body weight, diet, and physical activity across schools with and without nutrition programs. They created 2 different classifications of schools that had nutrition programs. The first included schools reporting that they had policies or practices in place to offer healthy menu alternatives and the other included 7 schools that are part of the coordinated program incorporating aspects of each of the CDC recommendations for school based healthy eating programs (a much more strict policy to implement in the schools) also called the Annapolis Valley Health Promoting Schools Project (AVHPSP). Veugelers and Fitzgerald assessed 3 critical dietary measures, (1) the number of daily servings of fruits and vegetables, (2) the percentage of calorie intake from dietary fat, and (3) a summary measure of overall dietary quality. To measure overall dietary quality, they used the Diet Quality Index-International that assesses dietary adequacy, variety, moderation, and balance.

Veugelers and Fitzgerald defined overweight and obesity using the International Body Mass Index Cutoff Points established for children for the purposes of their study. Multilevel regression methods were used to examine the effects of school programs on the following outcomes: overweight, obesity, fruit and vegetable consumption, fat intake, dietary quality, and participation in physical and sedentary activities.

They report that of the 5200 5th graders who completed the YAQ, 3656 (70.3%) attended one of the 199 study schools without a nutrition program, 1350 (26.0%) attended one of the 73 schools with a nutrition program, and 133 (2.6%) attended one of the 7 schools participating in the AVHPSP. Students from AVHPSP schools had lower rates of overweight and obesity and had better dietary habits in terms of higher consumption of

fruits and vegetables, less calorie intake from fat, and higher dietary quality index scores. These students also self-reported more participation in physical activities and less participation in sedentary activities. Rates of overweight and obesity among students from AVHPSP schools were significantly lower than rates among students from schools without nutrition programs. Still, students from schools with nutrition programs had somewhat lower rates of overweight and obesity than those of students from schools without nutrition programs as well. This difference however was not statistically significant. Diet and activities were similar among students from schools with and without a nutrition program.

Veugelers and Fitzgerald discuss the additional benefits of school nutrition programs: they can reach almost all children and may enhance learning and provide social benefits, enhance health during critical periods of growth and maturation of students, lower the risk of chronic diseases in adulthood, and help to establish healthy behaviors at an early age that will last long into adulthood. They also discuss that only a limited number of studies have been conducted on the effectiveness of school nutrition and physical activity programs and results of those programs have varied. The effectiveness of these programs has not been very well established. Veugelers and Fitzgerald mention that in a systematic review of similar intervention studies, Campbell et al. found only 7 studies on prevention of childhood obesity, 4 of which revealed programs that were effective and 3 of which revealed programs that were not.

Their study adds to the current knowledge base, but has its flaws, too. They argue that the benefits of potentially successful programs only recently introduced may have been missed. Schools with high obesity rates are more likely to initiate programs which may have masked their possible benefits. Intervention studies also rely on pre and post test comparisons, and thus have higher validity. For the purposes of this study though, pre-test measurements were not available for programs like the AVHPSP. This can decrease the study's external validity. Veugelers and Fitzgerald's study also involved a population-based comparison of school programs in a relatively homogenous setting in Nova Scotia. This study varies from the education system found in America, as the

school systems in Nova Scotia are all similarly funded public schools, much unlike the school funding system established by local districts in the United States. Also, the relatively high response rates and their adjustments for the nonresponse bias, they argue, should be considered a strength, although the exactness of such adjustments can be difficult to verify.

The report from the Texas Legislative Council Research Division is intended to summarize the findings on how related school policies, such as participation in school meal programs, the presence of additional food sources other than school meals, and the amount of physical education may affect obesity. The report summarizes scientific research on the effectiveness of school-based obesity interventions for the prevention and treatment of childhood obesity.

Kalakanis and Moulton found the following:

- School-based obesity interventions can reduce obesity in overweight children.
- The intervention components required for program or policy success cannot be determined at the time of the report.
- School-based intervention can improve the health-related knowledge, fitness, and nutrition of the student population.
- School-based interventions can also improve the fitness, nutritional intake, and self-esteem of obese children.
- School-based interventions do not prevent obesity or other physiological risk factors in the student population.
- The research is inconclusive about how school-based interventions affect activity level and self-esteem in the student population or on activity level and health- and nutrition-related knowledge in obese children.
- The relationship between school lunch program participation and being overweight is unclear. The presence of snack machines and other food sources, but not beverage machines, may decrease fruit and vegetable intake and increase fat intake. Lowering the price of healthy food may increase sales of these items.

Kalakanis and Moulton found that school-based interventions do reduce the severity of obesity in obese children. Sixteen studies they reviewed examined the effect of school-based interventions on obese children, and all studies but one fond that the treatment reduced at least some measure of obesity. They also found that school-based intervention affected the nutritional intake of obese children in a positive way. The studies they reviewed included decreases in the consumption of high sodium foods and increases in

the consumption of fruits and vegetables, but success in promoting a low fat diet is less clear. The effect on obese children's knowledge of healthy behaviors from school-based interventions is less clear as well. Some studies found no effect, and others found improved health knowledge among participating students.

Kalakanis and Moulton identify factors that may influence the effectiveness of interventions in their study. These are:

- Length of the intervention program
  - Some evidence suggests that shorter treatment periods may be associated with larger treatment effects.
- Age of the targeted children
  - The research suggests that interventions with adolescents may be less successful than interventions with younger children.
  - Voluntary activity programs may be the most successful when implemented with students in the middle elementary grades.
- Involvement of other family members in the intervention
  - Some research suggests that parental involvement improves outcome, but other studies find a mixed effect or a lack of an effect.
- Length of time after treatment the effects may be measured
  - Effects are more likely to be short term rather than long term.
- Components used in the interventions
  - A combination of components appears to be more successful than any component alone.
  - Most intervention programs involve multiple components, and research has not systematically examined which component(s) contribute most to the effectiveness of an intervention.
- Qualifications of treatment leaders
  - Successful interventions were led by trained outside professionals, such as physicians and nutritionists, school faculty, and peer counselors.

Kalakanis and Moulton also found that school-based interventions do not reduce obesity in the student population. The majority of the research supports that there is no effect of these programs on reducing obesity in the student population as a whole. They did however find that these programs do affect nutritional intake. All but 1 of the 16 studies found that intervention improved some measure of children's diets, like reduced fat intake and the increased consumption of fruits and vegetables.

Their research also concluded that vending machines are located in most middle and high schools in the US and generally dispense unhealthy, competitive food products to students. Competitive foods products are defined by foods served in schools that are not part of the National School Lunch/Breakfast Program. They noted that no studies that related obesity to school vending machines were available, but they did find that the presence of other food sources is negatively associated with consumption of fruits and vegetables and positively associated with a higher percentage of daily calories obtained from fat. Kalakanis and Moulton also found that the presence of school beverage machines may not affect fruit of vegetable consumption or fat intake.

They recognize that there are five characteristics that prevent them to some degree from generalizing their results to all children. First, interventions in the studies were often applied to small numbers of students. Second, the students in the interventions were often volunteers. Third, intervention effects often differed across ethnicity, gender, age group, or other characteristics. Fourth, intervention effects were not always apparent for all outcome measures. Lastly, sometimes multiple studies were performed on the same interventions with the same group of children; thus the results are based on a smaller number of children than is indicated by the number of studies.

Kalakanis and Moulton also recognize there is a limited ability to determine any causality in their research. They identify three characteristics of their research that inhibit them from determining the true causes of observed intervention effects. First, many of the studies lacked a control group, thus any treatment effect attributed to the intervention cannot be drawn with much certainty. Second, the lack of a systematic examination of intervention components limits the ability to determine which components are responsible for certain treatment effects. Finally, uncertainty about causal mechanisms relating knowledge, attitudes, behavior, and physiology prevents determination of whether changes in factors like knowledge of nutrition will produce improvements in reducing obesity.

The Government Accountability Office (GAO) found that the availability of competitive foods has increased in both middle schools and a la carte lines in many schools. They estimate that 9 out of 10 schools offered competitive foods through one or more of the following venues in 2003-2004: a la carte cafeteria lines, vending machines, and school stores. GAO also found that competitive foods available ranged from nutritious items like fruit and milk to less nutritious items like soda and candy, with nutritious foods more frequently available through a la carte lines than through vending machines or school stores.

They also found that no one person has responsibility for all competitive food sales at the school level. District School Food Authority (SFA) directors were commonly involved in policy decisions related to sales in the a la carte lines, where principals had final say over competitive foods sales such as items found in vending machines.

GAO also found that many schools raised a substantial amount of revenue through competitive food sales in the 2003-2004 school year. This money was used to finance food service operations and student activities. The most frequent uses were student field trips, school assemblies/programs, and athletic equipment and facilities.

They visited six school districts to survey their implementation of new nutrition requirements and programs to fight obesity. These schools took steps to substitute healthy competitive foods in the place of less nutritious ones. In the implementation process schools overcame obstacles to these changes; one of which was an impact on discretionary funds. The effects of these changes on the schools' revenue were unreliable because of limited data for analysis. GAO noted that in these schools, the main barrier to changing the foods offered in the competitive food sales were the concerns about potential revenue losses.

School Administrator Contact Matrix

School[38]	Administrator name and title	Email address	Phone number	Date(s) of contact	Interview date and time/refusal[39]
Henry Clay H	John Nochta	john.nochta@fayette.kyschools.us	859.381.3423	2-11, 2-14, 2-16, 2-20, 2-22, 2-26, 2-28, 3-1, 3-2, 3-6, 3-7	Schedule Conflict
Harrison E	Tammie Franks	tammie.franks@fayette.kyschools.us	859.381.3418	2-11, 2-14, 2-16, 2-20, 2-22, 2-26, 2-28, 3-1, 3-2, 3-6, 3-7	NR
Lafayette H	Mike McKenzie	mike.mckenzie@fayette.kyschools.us	859.381.3474	2-12	R
Bryan Station H	Gladys Peoples	gladys.peoples@fayette.kyschools.us	859.381.3308	2-11, 2-14	2-21@10:15am
Ashland E	Schuronda Morton	schuronda.morton@fayette.kyschools.us	859.381.3243	2-11, 2-12	2-20@9am
Dunbar H	Anthony Orr	anthony.orr@fayette.kyschools.us	859.381.3546	2-11, 2-14, 2-16, 2-20, 2-22, 2-26, 2-28, 3-1, 3-2, 3-6	R
Tates Creek H	Sam Meaux	sam.meaux@fayette.kyschools.us	859.381.3620	2-11, 2-14, 2-16, 2-20, 2-22, 2-26, 2-28, 3-1, 3-2, 3-6	R

Tates Creek E	Dee Patrick	dee.patrick@fayette.kyschools.us	859.381.3606	2-11, 2-14, 2-16	2-26@11:30am
Maxwell E	Heather Bell	heather.bell@fayette.kyschools.us	859.381.3516	2-11, 2-14, 2-16, 2-20, 2-22, 2-26, 2-28, 3-1, 3-2, 3-6, 3-7	NR
Johnson E	Frank LaBoone	frank.laboone@fayette.kyschools.us	859.381.3162	2-11, 2-14	2-20@11am
Arlington E	Robert Wilkirson	robert.wilkirson@fayette.kyschools.us	859.381.3030	2-11, 2-14, 2-16, 2-20, 2-22, 2-26, 2-28, 3-1, 3-2, 3-6, 3-7	NR
Lynn Camp H	Larry Mills	larry.mills@knox.kyschools.us	606.528.5429	2-11, 2-14, 2-16, 2-20, 2-22, 2-26, 2-28, 3-1, 3-2, 3-6, 3-7	NR
Knox Central H			606.546.9253	2-11, 2-14, 2-16, 2-20 2-28, 3-1, 3-2, 3-6, 3-7	NR
Corbin H	Joyce Phillips	joyce.phillips@corbin.kyschools.us	606.528.3902	2-11, 2-20, 3-1, 3-6	3-16-2007@9:30am
Flat Lick E	Jerry Jackson	jerry.jackson@knox.kyschools.us	606.542.4712	2-11, 2-14, 2-16, 2-20, 2-22, 2-26, 2-28, 3-1, 3-2	NR

Lone Jack E	Arnold Marsee Jr.	arnold.marsee@bell.kyschools.us	606.337.9461	2-11, 2-14, 2-16, 2-20, 2-22, 2-26, 2-28, 3-1, 3-2	Schedule Conflict
Pineville H	Paula Goodin	paula.goodin@pineville.kyschools.us	606.337.2361	2-14	2-16@11am
Pineville E	Jack Smith		606.337.3412	2-14	2-16@11am
Bell Central E	Greg Wilson	greg.wilson@bell.kyschools.us	606.337.3104	2-11, 2-12	2-16@10am
Bell Co H	Jeff Saylor	jeff.saylor@bell.kyschools.us	606.337.7061, 112, 107	2-11, 2-14, 2-22, 2-26	3-2-2007@12pm
Middlesboro H	Ed Jones	ed.jones@mboro.kyschools.us	606.242.8820	2-11, 2-14, 2-16, 2-20, 2-22, 2-26, 2-28	3-2-2007@1pm
East End E	Steven Martin	steven.martin@mboro.kyschools.us	606.242.8840	2-11, 2-14, 2-16, 2-20, 2-22, 2-26, 2-28, 3-1, 3-2, 3-6, 3-7	Schedule Conflict
West End E	Janis Barton	janis.barton@mboro.kyschools.us	606.242.8860	2-11, 2-14	2-16@1pm
Yellow Creek E	Jerry Lawson	jerry.lawson@bell.kyschools.us	606.248.1794	2-11, 2-12	2-16@12pm

Interview Contact Matrix

Name and Title	Department/Agency	Email	Phone number	Date of Initial contact	Interview Date	Type of Interview[40]
Dr. Jeff Jones	UK College of Public Health Center for Prevention Research	jeff.jones@uky.edu	859.257.5678 ex. 82087	1-12-2007	1/30/2007	F
Elaine Russell: Nutrition Services Coordinator	Obesity Prevention Program	Elaine.Russell@ky.gov	(502)564-4830 ex: 3843	3-5-2007	3/12/2007	P
Paul McElwain	Director of Kentucky School and Community Nutrition	paul.mcelwain@education.ky.gov	(502)564-5625	3-5-2007	3-5-2007 through 3-14-2007	E
Michelle Coker	Fayette Co. School System Food Service Director	michelle.coker@fayette.kyschools.us	(859)381-3839	2-27-2007	3-6-2007	F
Doris Cooper	Bell Co. School System Food Service Director	doris.cooper@bell.kyschools.us	(606)	3-2-2007	3-16-2007	F
Debbie Mayes	Middlesboro School System Food Service Director	debbie.mayes@mboro.kyschools.us	(606)242-8814	2-27-2007	3-2-2007	F

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702 KAR 6:090. Minimum nutritional standards for foods and beverages available on public school campuses during the school day; required nutrition and physical activity reports.

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